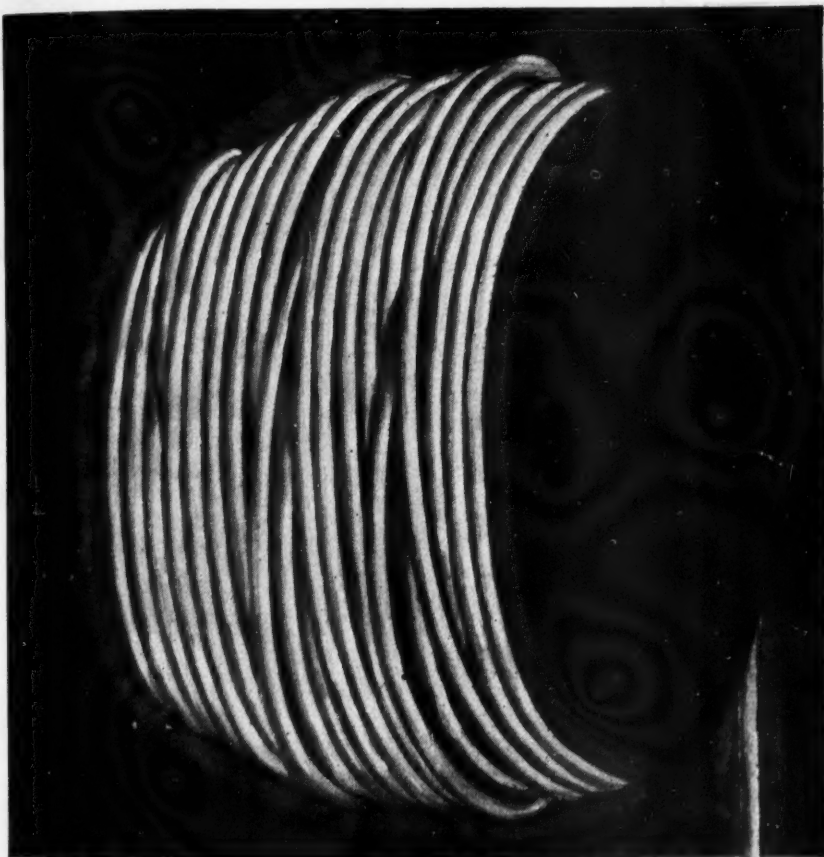


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Production for Balance of Year May Run Below 1925 Average

No slump expected, but few believe that fast pace set in passenger car sales during first quarter can be maintained during the last nine months.

By Norman G. Shidle

If—

Domestic passenger car sales for 1926 total about the same as in 1925,

and If—

Manufacturers do not wish their dealers to be carrying stocks at the beginning of 1927 heavier than the adequate stocks which they had at the beginning of 1926,

Then—

Passenger car production for domestic consumption in the last nine months of this year must run behind that of the last nine months of 1925 an average of about 10 per cent a month.

Sales for the first quarter this year ran well ahead of those for the same period last year. But unless all guesses about total sales for the year go awry, deliveries will be less heavy in the last nine months.

This means that curtailment in the maximum rate of factory production is likely within 60 days and perhaps within 30 days. Marked declines may not come in the height of the spring selling season, which is just about to begin, but in view of the large share of the year's business already taken by the first three months and the very adequate car stocks in dealers' hands, there is little reason for material production increases even though new car sales continue to improve in the next month.

A good many factory executives profess to see reason for keeping their output schedules up to a maximum until the end of the second quarter at least, while some see no reason for a decline until along in August. Study of trends in past years, however, together with analysis of current conditions in the field, indicates that this view is a bit too optimistic.

Here's the way some of the more conservative prophets are reasoning:

Last year's heavy production added to dealer's stocks well in excess of 100,000 cars—estimates vary from 125,000 to 150,000. This year production has been kept at a

"...There is good reason to look to the coming months with firm optimism, but with a realization that new production records do not necessarily spell prosperity."

high point during the first three months, so that, despite excellent retail sales, further additions to retailers' stock have been made throughout the first quarter.

While it is possible that we may sell 4,000,000 passenger cars in the domestic market this year as opposed to about 3,300,000 last year, it is far more likely that total domestic retail sales for the year will be something like they were in 1925. The very high retail sales of the first quarter, then, mean that we have taken a bigger chunk of

the year's total business in the first three months than usually is the case. As a result, sales probably will be less heavy, relatively, in the last nine months than they were in 1925.

This doesn't mean that there is going to be any big slump in the automobile business nor that an entirely satisfactory volume is not in prospect. It means simply that we have eaten somewhat more of the automotive sales pie than we would normally in the first quarter. What remains, consequently, is a bit smaller than it otherwise would be. But there is plenty to go around just the same.

"High" a Relative Term

There's been a lot of talk in recent weeks about car stocks being high or not being high. "High" is a relative term. Whether stocks are high or low depends on what the rate of future sales is going to be.

Right now stocks are not high if we reasonably can expect sales for the last nine months to go ahead at the same rate they have in the first three. But if a decline in sales reasonably can be expected, stocks undoubtedly are high.

The used car hasn't been considered sufficiently in a good many of the forecasts of automobile business recently. The outstanding fact developed by the telegraphic reports received from *Automotive Industries* correspondents for April 1 is that used car stocks are high in many sections of the country, that sales are slow

in some areas and slower in others and that used car prices are being slashed to remarkably low levels in many places.

Satisfactory used car conditions are reported from some sections, to be sure, but those sections are in the minority. Used cars are troubling dealers very much. Even in some places where strenuous methods are succeeding in moving used car stocks, merchandising costs are high and prices low. Signs of improvement in existing bad used car markets are reported in a few instances.

Chief Favorable Factors

With these facts in mind, let's line up the chief favorable factors in the automotive situation as the second quarter begins:

1. New car demand is keeping up well.
2. Farmers and agricultural areas seem to be in better shape than they have been for several years, and with good crop prospects the rural market should hold up throughout the year.
3. Definite improvement in conditions in California and the Pacific Coast in general is particularly encouraging because of the bad situation that has existed there for some time past. Used car stocks are beginning to be depleted on the Coast and some of the worst wildcatting in retail financing has been done away with.
4. Five out of nine prominent economic surveys predict continued good business for the next quarter or for the rest of 1926. Four others, see a continuance of thoroughly sound conditions, but predict a check in expansion, with profits for the year about on the same level as last year.
5. Plentiful employment at good wage rates makes continued buying in industrial centers likely.
6. Money continues to be easy.

On the other side of the picture, certain unfavorable factors do appear. Among them may be listed:

1. Generally speaking, the used car situation is not satisfactory.
2. Curtailment of production will be necessary soon to prevent overstocking dealers, unless retail sales for the year go to entirely unforeseen levels.
3. Building declined somewhat in February and March, the drop being somewhat greater, according to *United Business Service*, than can be accounted for by ordinary seasonal dullness.
4. The succession of breaks in the stock market, while not to be taken too seriously as a business indicator, may have the unfortunate psychological effect of causing hesitation in certain quarters.
5. Commodity prices have been falling for several weeks.

Optimism is Warranted

Weighing these various factors and combining them with opinions gathered from important factory sales executives who have been traveling extensively in the field, there is good reason to look to the coming months with firm optimism, but with a realization that new production records do not necessarily spell prosperity.

None of the unfavorable aspects of the situation are such as to cause alarm. The favorable ones bear a message of continued sound business.

The present condition of the automotive industry as regards car stocks and production has been compared to that of 1924 many times in recent weeks. Superficially,

there are many aspects of resemblance in the two situations. In both cases the industry went into January with fairly high car stocks; in both instances production was held to a high level during the first quarter; and in both instances talk of keeping output at peak load throughout the year was heard.

But fundamentally, an important difference exists.

Automotive executives today are thinking and acting more soundly and more conservatively, are utilizing more fact studies, are tempering optimism with common-sense business judgment to a far greater extent than they were back in 1924.

At that time a large proportion of the men at the merchandising helms of car companies were thinking, talking and acting privately in the same way they were talking for publication. There seemed to be a deep-rooted belief that the automotive industry might be superior to economic facts and that cars could be sold somehow or another far in excess of the public demand.

Today there is little of that spirit in evidence. In a single week recently we talked personally with the chief sales executives of a large number of important passenger car companies. In no case did we find an executive who had any idea of shutting his eyes and going ahead with factory production and shipments in the blind hope that any given number of cars could be distributed.

Watching Conditions Closely

Optimistic? Yes, they were optimistic, as any sane business man would be optimistic on the basis of the facts as they appear today. Every one of them was going to do his level best to keep his sales curve up longer than that of his competitors. Every one had confidence in his ability to do it. But every one of them was watching conditions very carefully, talked sales prospects in terms of business and economic trends and evinced every determination to run his affairs on the basis of well-laid plans with a minimum of that bombastic exuberance which at one time seemed to characterize so much discussion of automotive prospects.

This sound tendency to analyze conditions and to adapt factory plans and methods to the results of such analysis should be borne in mind very clearly when anybody begins to compare the present automotive situation with that which existed at the beginning of 1924. There are exceptions to the methods outlined, of course, but there can be no doubt, generally speaking, that most automotive executives today are in a far different frame of mind than at the beginning of 1924 and that this fact alone is probably the strongest barrier that exists against anything in the nature of real difficulties.

The reports on current conditions just received from *Automotive Industries* correspondents bear out to a considerable degree the favorable view of present trends held by sales executives who have been in the field recently, although in some instances the surveys show soft spots which perhaps have not been generally recognized. Following are the reports:

SAN FRANCISCO

Passenger car sales did not pick up during March in Northern and Central California as had been expected, being only about twenty-five per cent better than February, which was a low month. Parts and equipment dealers, however, report a steady increase in business since the first of the year. March showed an advance of nearly fifty per cent over March of last year.

Used cars, according to reports of trade associations, are moving about fifty per cent faster than they did in

February and nearly twenty per cent better than in March a year ago. The strong tendency which has developed in this territory to repair old cars or buy used cars rather than purchase new ones added strong sales resistance to February passenger car merchandising.

Trucks are going well on seasonal demand and on prospects of heavy crops with high prices. Loans on cars are being held very low by finance companies, and a number of banks in San Francisco are refusing to lend money on real estate when money is to be used to buy an automobile.

LOS ANGELES

March sales this year increased materially over March of last year, the gain being conservatively estimated at about twenty per cent.

Buying demand finds some distributors short on cars owing to caution in placing advance schedule of orders in accordance with previous uncertain attitude regarding response in spring market. March sales established confidence generally and a good season is expected.

Used car stocks while still large are being thinned with greater success than for many months. Repossessions grow increasingly large, a natural reaction from epidemic of low down-payments and extraordinarily long terms last fall.

SALT LAKE CITY

Automotive business in Utah made big gains during March. The weather has been very favorable and the increase in the sale of passenger cars is especially marked. Truck sales have picked up also. Few buses are being marketed at present, though confidence in the bus business is better now than it ever has been in this State, and there is no doubt that a little later in the season some nice bus business will be reported.

A number of dealers report used car stocks as very low, but others continue to have considerable trouble in disposing of used vehicles. Several open used car markets are being established. There is a good demand for used closed cars, but open models, more than one or two years old, are very difficult to move.

Competition is unusually keen in both new and used cars. The "Metropolitan" dealer plan is filling Salt Lake City with dealers but business is better in the metropolis than in any other part of the State at this time.

DALLAS

The financial situation in Texas and parts of Oklahoma, Louisiana, Arkansas, New Mexico and Arizona was inclined to "tighten up" as March closed. This was due to uncertainties of the crops to be harvested in the summer and fall and had a tendency to curtail buying in many lines. There was a slight slump in the automotive lines along with other industries.

Actual sales of new cars in March were a little less than for either January or February. The rural districts were practically out of the market because farmers were not willing to gamble on what crops would produce six months hence. Merchants and wage earners in rural districts were in same frame of mind.

Used car sales in March were about same as in February in cities. Rural districts were not in market except where dealers cared to take an old car and make remainder payment due in six or eight months. Dealers are accumulating bigger stocks of used cars.

Trade in parts and accessories in March was some bet-

ter than in February because of garagemen preparing for spring overhauling.

DES MOINES

New car business in March was slow, probably ten per cent below same month of last year. Bad roads in some sections of the State have handicapped dealers. Sales in cities have been fairly good. Quarterly reduction of license fee effective April 1 is partly responsible for poor showing during latter part of month. Warmer weather has stimulated used car sales. Business better during last two weeks of March.

DENVER

Automotive business in Colorado for March showed a slight increase over February, but was considerably behind the same month a year ago. The explanation offered is two-fold. In the first place tax payments in Colorado and assessment time as well have been moved from March 1 to April 1. Automobiles bought after April 1 will not be taxed for 1926, and many prospective buyers were taking this into account. Tax paying time always slows up car purchases, and this year it fell in March. The second reason is obvious. Many distributors and agencies did not make the two per cent sales tax reduction effective till the end of this month, and buyers were awaiting the reduction.

Ample rains and snows evenly distributed have assured crops in all irrigated districts at least, and have made excellent prospects for the dry farmers. Good sales are predicted for April.

MILWAUKEE

March sales of passenger cars showed a gain over February, judging by comparative figures available. The gain is irregular, however, some makes barely outdistancing the last month's figure, while others are substantially higher. Opinion respecting conditions is more conflicting than it has been for several months past. Employment is the best in more than four years and there appears to be a job for anyone in Milwaukee who wants to work. Wages show no sign of reduction. Skilled mechanics are at a premium.

Strenuous efforts are being made to market the great mass of used cars. Some of these efforts are being well rewarded; others are not doing so well.

MINNEAPOLIS

Sales totals in this district continue to show large percentage increases over last year for new automobiles and the used car activity is beginning. Owing to good weather all winter the automobile business in Northwestern States has gone ahead more rapidly than usual. Retailers and their clients have taken cars as fast as deliveries were made, so there is no stocking of cars either in the branches or the agencies. An increase of 400 per cent over 1925 is not unusual to find in a survey of distributing house totals for February and March.

CHICAGO

New car sales in Chicago in March were from 15 to 20 per cent greater than during the same month last

year. As compared with February, sales this month were about the same, unusually severe weather having materially affected the volume.

Used car stocks are scarcely heavier than normal for this time of the year, the earlier overstocked market having almost entirely disappeared at this time.

Dealers and distributors have been offering used cars at low prices after reconditioning them, and particularly the exclusive used car dealers have been enjoying an unusual business considering the season and the weather.

DETROIT

March, an unusually good month considered as a whole in the automotive industry, had its luster somewhat dimmed by two factors; one was the weather and the other was the downward trend of the price of motor stocks. The latter had its effect in helping to circulate unreliable rumors about the industry.

It was believed at the factories that the bad weather prevailing in many of the Northern and Northwestern States during the first week and a half of the month would break, causing the opening of the spring buying. Such was not the case and many companies were forced to revise their production schedules when the cold spell failed to break. Again they increased them when it seemed likely that spring had finally arrived.

Taking the entire State of Michigan as an example, it can be said that the spring buying season at present is approximately three weeks behind.

Dealers' stocks have increased.

The truck situation improved materially during the month. Every company in the Detroit district reported it as one of the best months in history. Sales kept pace with output.

CLEVELAND

Cleveland's colony of car makers during March put out more automobiles than in any previous March on record and also bettered February's mark by a comfortable margin. New car sales were anywhere from ten to thirty-five per cent better than new car sales in March, 1925.

Used cars are moving very slowly. Accessory business likewise is poor.

COLUMBUS, O.

Although weather conditions in March were poor, a large majority of distributors and dealers in Central Ohio had a brisk trade during the month. Comparing with the records of March a year ago, the percentage of gain is between 10 and 12, which is considered very good when the weather conditions are taken into consideration. In agricultural sections, there is a better feeling which is reflected on the automobile trade.

The used car situation is far from satisfactory. All dealers are overstocked with used cars and special sales have not been very potent in moving them. But the situation has improved slightly during the past few weeks.

PITTSBURGH

Sales of new cars in Western Pennsylvania were fair in March but used cars moved too slowly to be pleasing. Replacement sales reached a high percentage of the total, for volume of new business in the extreme low priced field probably was not as good as in the same month last year. Outlook for April, however, is considered unusually

good. Dealers were very exact in the conditions under which they traded and no exorbitant figures were paid for used cars. Thus, they are in a better position to carry used cars.

PHILADELPHIA

Compared with a month ago, new car sales have materially increased. Dealers agree that few open models are being asked for at this time. Sales of new cars in general are reported as better than a year ago this time, both in the urban and the rural districts, with prospects for the coming month bright in each case.

There has been a large influx of used cars as trades in sales of new models and many dealers find themselves stocked more heavily at this time than is convenient.

Both heavy duty and light commercial trucks have received a sales impetus in the past fifteen days and many companies report an upward trend.

NEW YORK

Although further stock market declines, prevalence of considerable hand-to-mouth buying and reports of less favorable conditions in some of the major trades might be regarded as signs unfavorable to the automotive industry, car sales in the Metropolitan territory do not bear out this theory. There are plenty of automobile leaders, in both car and accessory fields who are not at all pessimistic as to the immediate future or even as to the last six months of this year.

Despite the fact that spring here as elsewhere is somewhat backward, 4182 new cars were sold in the Metropolitan territory during the first two weeks in March, a gain of 818 or 25 per cent over the total for all of February and a gain of 266 or nearly seven per cent over the first two weeks of March last year.

From January 1 to March 13 this year 14,319 new cars were sold against 10,577 in the 1925 period, an increase of 3742 or 35 per cent.

In March, 1925, total sales were 10,319. With 4182 sold during the first half of March this year this leaves 6137 to be sold during the last half to attain the March, 1925 total. That total will probably be exceeded, since the third and fourth weeks of March this year are running much stronger than the first and second weeks, which in turn were higher than the corresponding weeks of March last year.

BOSTON

Motor car dealers are waiting to welcome the passing of April 1 so they can start moving their cars, new and used. Under the Massachusetts law any person who does not take possession of a car until April 2 or later does not have to pay any property tax on it. As this tax ranges anywhere from \$20 to \$40 per thousand it means enough to pay for a registration tax and have something besides.

During the first half of April there will be a rush all through the State to deliver thousands of cars which are being housed in the salesrooms, warehouses and such places. This will mean so much work that it will handicap some of the smaller organizations in following up prospects.

Sales have not been very gratifying since the show. Salesmen report that there is a real hesitancy on the part of many to buy this year that was not noticeable in other

(Continued on page 589)

Just Among Ourselves

Good Roads Save Car Operating Expense

NEW evidence—not from a laboratory, but from records of practical experience—is available to indicate the savings in motor car operation which come from good roads. Procter & Gamble Co., has 450 automobiles used by its salesmen in all parts of the country. Last year these cars traveled a total of 5,039,000 miles and careful records of upkeep costs were kept. And differences as high as two or three cents a mile in operating cost are recorded between cars operating in states where good highways are known to be numerous and those in which good roads are not as common. In California, for instance, the Procter & Gamble records show, the operating cost per mile was \$.045 and in New York, \$.048, while in Kentucky the cost ran up to \$.067 and in Tennessee to \$.071. While no mention is made in the announcement as to the type of car used, it is assumed that in making such a comparison similar vehicles were used in the States compared; otherwise, of course, the figures would mean very little. Calculated on this basis it would be easy to figure the savings to motorists through good roads as being well into the billions for a year as compared to operations under relatively poor road conditions.

* * *

Instalment Buying Hasn't Impaired Wealth

BEFORE deciding that instalment buying is wrecking the foundation of American civilization it is interesting to note the progress that has been made in certain fundamentals of stability during the period in which instalment buying has been extended to its greatest limits. Between 1920 and 1925, for example, savings bank deposits have increased 57.9 per

cent, despite the fact that population during that time went up only a little over 7 per cent; or, to show the advance more accurately, deposits per person increased from about \$146 to \$204. Add to this the fact that the number of depositors more than doubled in the same five years and the extension of instalment buying begins to look less like an ogre than it has been painted.

* * *

Has Come to Stay and is Sound

THE figures which form the basis of the preceding calculations appear in an interesting, although somewhat loose-knit, study of instalment buying recently published by the Farmers' Loan and Trust Co. of New York. The survey shows that the value of automobiles sold on time payments constitute an extremely large proportion of all the instalment buying, probably as much as two-thirds. It indicates also that between 65 and 85 per cent of washing machines are sold on time; that 75 to 80 per cent of phonographs, 25 per cent of jewelry, and a considerable proportion of radios are sold on the instalment basis. Commenting on the investigation, the Girard Trust Co. says, in *The Girard Letter*, "Broadly speaking, it seems to us that instalment buying is justified in so far as the purchase of necessities is concerned. While automobiles do not come within the category of a necessity, yet nevertheless, in the main they have done so much for the health, enjoyment and efficiency of the people as a whole that to condemn their sale on the instalment plan would hardly seem to be justified." Which makes us voice agreement with the remark of L. W. Maxwell, president of Crowell Publishing Company, quoted in the same survey, to

the effect that "I think the practice has come to stay and will develop as a sound phase of business whether it is encouraged or not."

* * *

If the Automobile Isn't a Necessity, What Is?

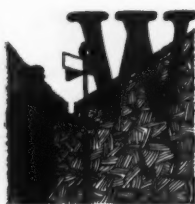
AND now that *that* is settled, let's go back to the statement in *The Girard Letter* that "automobiles do not come within the category of a necessity." We can't allow that to go unchallenged. If the automobile, broadly speaking, is not a necessity in the present-day economy of the nation, what is a necessity? We can think of only three things which might be classed as real, fundamental necessities in the sense that they are essential to keep body and soul together. These are food, clothing and shelter. Whatever we have beyond these simple requirements are necessities only insofar as they satisfy our ambition for comfort, progress and civilization, and if, considered in this light, the automobile has not become a necessity in the United States, then our great business marts, our steamships, our railroads, our street cars and subways, our telephones, our electric lights are not necessities. As a race, we lived before we had any of them. As individuals we can live without legs and arms, but that is no reason for classifying a leg or an arm as a non-essential. Our nation as constituted today moves on four legs: Railroads; surface, underground and elevated railways; motor vehicles, and ships. As a nation we could manage somehow to survive the loss of any one of these legs. But no matter which one we lost we would be seriously crippled. Insofar as we desire to maintain unimpaired the material progress we have made, all the legs must be considered as necessities.

—N. G. S.

National Safety Conference Drafts Model Laws, Disbands; Future Action Up to States

Over 1000 delegates take part in framing of motor vehicle regulations at Washington. Automotive industry well represented. Hoover pleased.

By John C. Gourlie



WITH commendable economy of time and words, the National Conference on Street and Highway Safety, meeting in Washington, March 23, 24 and 25, achieved the most important step in the safety movement to date with the approval of three model vehicle laws for submission to the States as the basis for uniform legislation, and materially added to the sum of knowledge on such subjects as law enforcement, traffic facilities and accident statistics.

The progress made was the more remarkable for the fact that the group numbered over 1000, having been swelled by the addition of several hundred delegates appointed by State governors. There was thus more than the normal proportion of members with a penchant for oratory, but the conference assumed the prerogative of a democratic body and introduced rules limiting the time and subject matter of debate.

So far was the work of establishing the basic principles of highway legislation and traffic control advanced that Herbert Hoover, who initiated the first meeting more than a year ago, felt it unnecessary to recommend the calling of further national conferences, deeming the problem now one for the State, municipal and other organizations to pursue to its logical conclusion. Various committees of the Conference will proceed with their work, which is mainly that of securing action by established public and private bodies. The thought of the Secretary was expressed in these closing words to the Conference:

"It has not been our purpose—nor has it developed in debate—that we are engaged in establishing new organizations but rather that we should establish cooperation between organizations of different localities. I have conceived this Conference and other conferences of this character as perhaps the first steps in a new conception of



"The recommendations of the Conference on the subject of metropolitan traffic problems make it plain that a great deal more study must be given if the cities are to be enabled to handle the increased number of vehicles the motor vehicle industry expects to place on the streets." Scenes on these pages, although taken in New York, could be duplicated in almost any other large city and give an idea of scope of the traffic problem

government. Not government from a central authority, but government by stimulation of the local community to its responsibilities and the education of the local community to intelligent action. That to me is a far wiser, a far greater solution than the constant drive to centralize the government of the United States."

The conference differed greatly from that of December, 1925, both by reason of its personnel and by having a very definite program beforehand for its action.

The inclusion of the State representatives was evidently felt by Mr. Hoover to carry out his intention of making the Conference completely representative of the elements interested in highway safety and elimination of traffic waste. In calling the first conference he included representatives of the organizations interested, but with the advancement of the work it seemed desirable to establish closer contact with the State administrations and legislatures.

There was little or no evidence of a clash between opposing interests within the conference. This too seemed to be the result of the inclusion of a large proportion of public officials and their representatives. Both the automotive and the railroad groups were smaller this year than last, numerically as well as proportionately.

In its widely representative character, the Conference was perhaps unique in the annals of gatherings involving important questions of public policy. Add to this a willingness to apply hard work and serious thought to the problems involved, and the basis was established for a large measure of accomplishment.

The Conference 15 months ago was mainly concerned with the establishment of principles and the laying of a program for giving these principles concrete form for ap-

plication to legislation, enforcement and planning for the future. This year it was able to agree on model uniform laws, which was considered the most important need of the moment, and it presented plans for measures designed, over a long period of time, to increase traffic facilities and reduce or wipe out the loss involved in traffic congestion.

The proposed uniform vehicle code is divided into three titles:

1. A motor vehicle registration and certificate of title act.
2. A motor vehicle operators' and chauffeurs' license act.
3. An act regulating the operation of vehicles on highways.

It would not be possible, even if space permitted, to publish these in full, as the draft presented to the conference by the Committee on Uniformity of Laws and Regulations was subjected to debate and several important principles were changed, necessitating the redrafting of the acts, which will take some time. However, in the main they follow the principles of legislation of the States that have given most consideration to the safety problem, and where they differ the States themselves have differed to a considerable extent.

The attempt to interject a radically new provision affecting tail-lights led to the most spirited exchange of views that arose at the conference. In the original draft, the act would require the use of "yellow (or red)" tail-lights, the purpose being, in time, to restrict the use of red to the stop light. On behalf of this proposal it was said that the use of yellow as a cautionary signal was becoming general, and if so used the red stop light would acquire added significance, while under present conditions the constant sight of red lights in night driving dulls the eye of the driver to the color. Railroads would

AMONG the more important provisions incorporated in the model laws drafted by the Conference were:

Tail-lights to be yellow or red, at the discretion of the individual States.

Two separate means of applying brakes, each of which shall be effective to apply the brakes on at least two wheels.

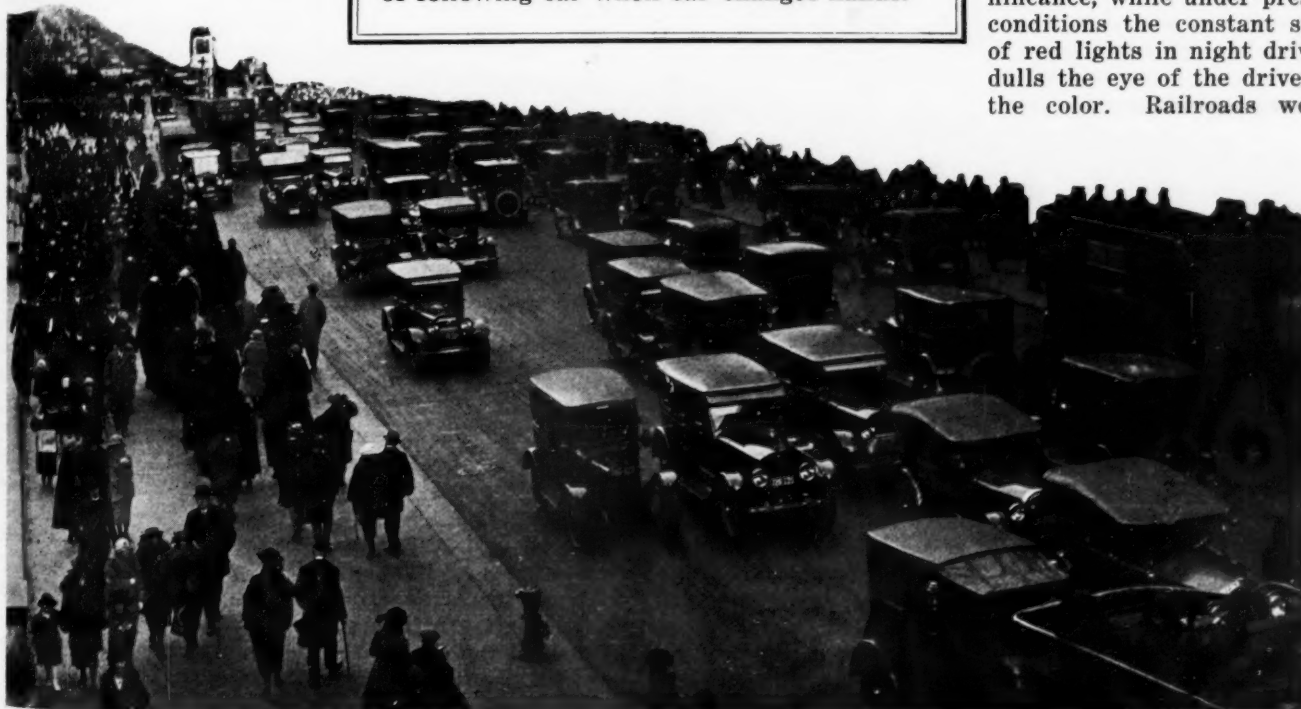
Compulsory use of windshield wipers and rear vision mirrors where rear view is otherwise obstructed.

Thirty-five mile speed limit on open roads.

Vehicle on right recognized as having right of way.

Minimum age for operators of private vehicles, 16 years; for chauffeurs, 18 years.

License plates remain with owner instead of following car when car changes hands.



benefit through the reduction in confusing red signals on roads paralleling tracks.

Having in mind the inconvenience and confusion that would arise during the period of transition from red to yellow, the automotive group opposed the provision, which was at first passed by a narrow margin. On the closing day, however, Mr. Hoover recommended that the wording be changed to "(yellow or red)" and a commission of engineers and other experts be appointed to draw up a report on the matter to be submitted to the States along with the final draft of the act. This was approved, to the apparent satisfaction of all concerned.

Brake Provisions Amended

The brake provisions of the original draft would have proved a hardship to manufacturers of some small cars, providing "service brakes and an additional and independent emergency brake." This was changed to "two separate means of applying brakes, each of which means shall be effective to apply the brakes to at least two wheels and so constructed that no part which is liable to failure shall be common to the two."

Windshield wipers would be required by the legislation, and rear-vision mirrors where the view of the driver to the rear is obstructed.

Provisions affecting car-renting systems include issuance of the same type of plates as issued to other private passenger motor vehicles; owners and drivers to be jointly liable for damage; authorizing the motor vehicle commissioner to require a showing of financial responsibility by the owner; and requiring a record, open to inspection, of all persons to whom cars are rented.

A provision permitting the issuance and display of temporary license plates or the use of placards pending the receipt of permanent plates was struck out of the act after considerable debate and several votes. Another moot point, regarding license plates where sales or transfers are effected, was decided in favor of having the plates remain with the owner rather than following the car.

Speed limits, after discussion, were placed at 35 miles on the open highways, 20 in residence districts, 20 in business districts when traffic is controlled by traffic officers on stop-and-go systems, and 15 in all other business districts and where approaching and passing schools, grade crossings, etc. The new theory of minimum speed regulations, as a safety measure as well as to expedite traffic, has not gone very far, if the temper of the Conference on this point is to be taken as a criterion. Eloquent appeals for such legislation won little support, although the replies were mainly of a sentimental character interspersed with irrelevant anecdotes purporting to show the evils of rapid driving, which, of course, are not questioned.

Minimum Age for Operators

The minimum age for operators was placed at 16 years and for chauffeurs at 18 years, despite strong efforts to raise the limits. It was held that the demand from farmers for licenses for their young sons is so strong that no law carrying a limit higher than 16 years could be passed.

A provision in the original draft permitting drivers to pass street cars taking on or discharging passengers when a clear passage of eight feet could be left between the automobile and the car was eliminated by vote of the Conference. As to the right of way, this is given to the vehicle on the right, and there was no discussion of the subject in the Conference.

The certificate of title provisions in the registration act provide for the holding by the finance company of

the certificate until the encumbrance is lifted by the final payment.

Debate on the proposed uniform laws occupied the major part of the time spent by the Conference. This was inevitable, and no doubt the end sought justified the effort, for the adoption of uniform legislation should be a great aid to the safety movement and is the necessary ground work for the betterment of driving conditions and for detecting theft and other crimes. But in a sense it is unfortunate that this is the situation, since the great need of the present and the future is the reduction or elimination of traffic congestion in the cities.

Accidents are certainly a source of sales resistance in the automotive industry, but metropolitan traffic conditions are much more serious obstacles. A large proportion of persons doubtless never think of the possibility of their being involved in accidents as drivers of cars, but every urban-dweller is cognizant of the difficulty in driving in the business sections of the cities and, to almost the same extent, on the main highways on Sundays and holidays. This is the part of the general movement that the automobile industries ought to concentrate on, especially now that the immediate safety measures appear to be in strong hands.

The recommendations of the Conference on the subject of metropolitan traffic problems make it plain that a great deal more study must be given if the cities are to be enabled to handle the increased number of vehicles the motor vehicle industry expects to place on the streets. The report deals in general terms with the various plans of traffic control already more or less in operation. But the urgent need in most cities for greatly expanded traffic facilities is referred to only indirectly.

Jay-Walking Evil Exaggerated

As a matter of fact, the traffic problem can very well be divorced from the safety question. In virtually all cities today traffic is so regulated that by far the greater proportion of serious accidents occur in the residential sections, where constant police supervision is lacking. Hence the insistence of the Conference on rather heavy penalties for jay-walking appeared to be out of proportion to the importance of the matter.

From this point of view the failure of the Conference, which is primarily concerned with safety, to go thoroughly into comprehensive plans for expansion of traffic facilities may be considered above criticism, but the need for the automotive industry's attention to the problem thereby becomes plainer.

To return, however, to the work of the Conference on the safety problem, one of the most interesting reports was submitted by H. L. Horning, president of the Motor and Accessory Manufacturers Association, representing the committee on the motor vehicle. He told of the progress made by the engineers of the industry in improving the design of motor cars in the interests of safety. Referring to the research made into headlighting principles during the last year he said:

"We have found that with regard to headlights it is not a question of too much light but too little. We must have more light, and we have decided that it is possible to have stronger lights without glare. This goal is not far distant.

"Better braking systems have been devised, and the worst offender during last year improved his brakes.

"Vision in closed cars has been made clearer through the elimination of heavy corners.

"Steel bodies have been designed and widely adopted—mainly from safety considerations.

"The wider adoption of balloon tires is an advance in safety seldom understood. By reducing vibration these

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tires reduce the fatigue of metal and the fatigue of drivers. There seems little doubt that weariness from long driving is the cause of many accidents. Through balloon tires this problem has been largely met in the case of passenger cars, but much remains to be done with trucks."

Another representative of the industry who contributed a paper was John Hertz, chairman, board of directors, Yellow Truck & Coach Mfg. Co. After telling of the extraordinary pains taken to obtain careful drivers for his taxicab companies he stressed a point brought out on one or two other occasions, that the safety movement depends as much on education of the public as on restrictions and tests affecting drivers. Figures were presented which showed that fatal collisions of motor vehicles with pedestrians, already amounting to 60 per cent of the total number of fatal traffic accidents, are increasing at a rate out of all proportion to the rate of increase in other traffic fatalities.

Decline in Fatality Ratio

Elsewhere, however, it was noted with satisfaction that the ratio of increase of traffic fatalities declined in 1924, and, on the basis of incomplete figures, the trend continued in 1925. Seemingly the States which had strengthened their motor vehicle laws were the leaders in the reduction of accidents in the slowing up of the increase, and this was cited in favor of the proposed uniform laws.

The need of more comprehensive statistics regarding all traffic accidents was strongly felt, and the Conference recommended uniformity in reporting and tabulating schedules, with standard definitions of terms.

The unsatisfactory state of knowledge with respect to the causes of accidents was commented upon several times. Said Mr. Hoover:

"It seems that too often the cause of the accident which is reported is either not a cause at all or is simply a collateral or contributing cause, and that very little is known about fundamental causes."

The one really weak point of the whole safety movement is here touched upon. If any clear cut analysis of causes could be made, doubtless many of the recommendations of the Conference would be subject to revision. As it stands, a fair proportion of them are based on supposition rather than proved fact. For instance, great emphasis is placed on drivers' tests, yet the available statistics fail to show that inexperience is more than a most infrequent cause of accidents. On the other hand, it is fairly plain virtually all accidents involve experienced drivers.

Committees to be Appointed

But the safety movement, as it is to be pursued under the plans of Mr. Hoover and the Conference, is flexible enough to act effectively upon any contributions to knowledge and experience. Committees are to be appointed by the various member organizations concerned in the movement, who are to continue study where needed and secure the cooperation of the groups in promoting the adoption of the Conference recommendations. These committees are to function under the following heading:

- (a) Traffic laws and regulations.
 - (b) Enforcement of laws and regulations.
 - (c) Education.
 - (d) Statistics.
 - (e) Study of causes of accidents.
 - (f) Design and maintenance of motor vehicles.
 - (g) Street and highway traffic facilities.
 - (h) Elimination and protection of grade crossings.
- A general committee, under the recommendations, will

be appointed by the Secretary of Commerce to coordinate the entire work. In addition, under a resolution introduced by Governor John G. Winant, of New Hampshire, it was recommended that the State delegates bring about the calling of State conferences for consideration of how best to carry out the proposals of the national Conference.

Among the men of the industry at the Conference, in addition to those mentioned, were: George M. Graham, Chandler-Cleveland Motors Corp.; William E. Metzger, Federal Motor Truck Co.; Percy Owen, Dodge Bros., Inc.; John C. Long, Russell Huffman and Pyke Johnson, National Automobile Chamber of Commerce, and M. L. Heminway, Motor and Accessory Manufacturers Association.

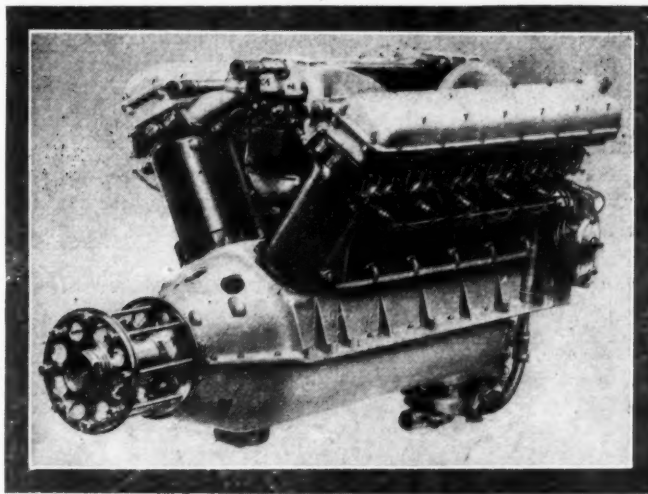
New Fiat Aircraft Engine

A HIGH-POWER aircraft engine comparable with the best available in this country has been turned out by the Fiat Company in Italy. The engine, which has been rated officially at 410 hp. at 2060 r. p. m., has just completed its official test by running for 75 hr. at nine-tenths rated load, with preliminary tests for maximum power available and fuel consumption.

An analysis of these tests show that while the engine weighs but 705 lb., including cooling water, propeller hub and starting device, giving it a dry weight of well under 1.6 lb per hp., it will develop 430 hp. at 2200 r. p. m. with the unusually low fuel consumption of .485 lb. per hp.

During the 75 hr. run at 9/10 load, an even better fuel consumption was maintained, the average for the 75 hr. being .45 lb. per hp. The oil consumption during this run, as well as at full throttle, did not exceed .022 lb. per hp., which is considered good practice in this country.

The engine is of the direct drive type, and is similar in appearance to the twelve-cylinder V-type engines used in this country. Double carbureters are used to supply the



New Fiat 410 hp. direct drive airplane engine

fuel, each venturi supplying three cylinders. As is the usual practice in aeronautical engine building, ignition is also by the dual system, two sets of spark plugs per cylinder being provided. Each bank of cylinders is cast en bloc, both upper and lower half of the crankcase, as well as the cylinder head and the intake manifold, being of aluminum alloy.

AN agreement has been entered into by the national benzol manufacturing or recovering associations of England and Germany whereby they exchange their engineering experiences.

Smalley Rail Car Mechanically Driven Through Herringbone Gears

Powered by two Climax four-cylinder engines which develop 76 hp. at 1200 r.p.m. Gear changes effected with Campbell sliding key arrangement. Radiator fan driven by spur gears.

By P. M. Heldt

A RAIL car with mechanical drive through herringbone gears has been developed by the Smalley Rail Car Co., of Davenport, Iowa. With herringbone gears it is, of course, impossible to slide the gears into and out of mesh, and for changes of gear the Campbell sliding key arrangement familiar to automobile men through its use in the Chandler Traffic Transmission, is used. The car has really two variable gears connected in series, and any gear in the first set can be combined with each gear of the second set, whereby a large range of speed variations is made possible.

The car under discussion is a full-sized railroad car, 60 ft. long, conforming in all respects to modern steam railroad practice. It is powered by two Climax four-cylinder engines of 5½ in. bore and 7 in. stroke, which develop approximately 76 hp. at 1200 r.p.m. The normal rating of the engines, however, is 57 hp. at 800 r.p.m. These are regular heavy-duty engines with force feed lubrication and pump circulation of the cooling water. The cylinders are cast in pairs and are bolted down to a cast iron crankcase which is split through the crankshaft axis. The crankshaft is 2½ in. in diameter and is supported in three main bearings. A rather unusual feature of this engine is that the radiator fan is driven by spur gears.

The two engines are placed side by side at the forward end of the car and are clutched independently to a common gear-box. It is thus possible to drive the car by means

of either engine, or by both, the change being made from the driver's compartment.

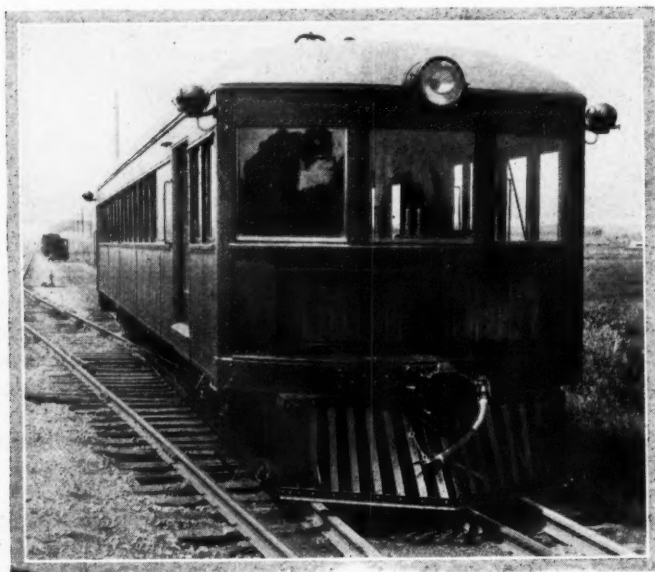
There is a Twin Disk clutch on the crankshaft of each engine. These clutches are held in engagement positively or mechanically—that is, not by a spring—and the engine therefore can be operated declutched for any length of time without risk of trouble with the throw-out collar.

Starting and stopping of the engine and engaging its individual clutch is effected by a single lever, which simplifies the control operations. An engine synchronizer is used, whereby racing of the second engine is prevented when it is started up or declutched.

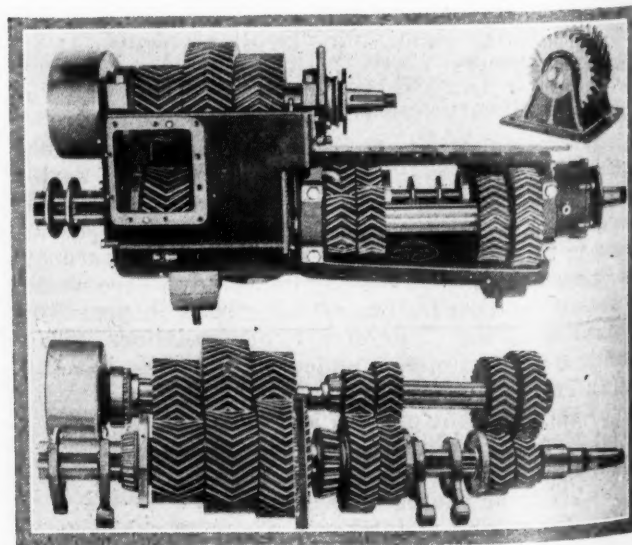
Transmission in Two Sections

Immediately behind the two individual clutches there is a train or set of three herringbone gears, all of 5 in. face width, of which the two outer ones are driving gears while the central one is a driven gear. Through the individual clutches and the two outside gears the power of the two engines is transmitted to a common shaft on which the driven gear is mounted. Connected to the driven gear is the master clutch, which is also of Twin Disk make.

The gear-changing mechanism, as already pointed out, comprises two parts. One of these gives four changes of gear, while the other one gives a high forward range, a low forward range and a reverse range. Since any gear in the primary portion of the transmission can be combined



Smalley rail car built for the Susquehanna Railroad



Two views of the mechanical transmission of the Smalley rail car

with any gear in the secondary portion, it follows that eight forward and four reverse speeds are available. The highest speed attainable in the low-speed range with the engine running at 1150 r.p.m. is 43 m.p.h., while the highest attainable in the high-speed range with the same engine speed is 63 m.p.h.

The gears of the transmission are of very substantial size. All of those in the secondary part of the transmission are single piece herringbone gears of 4 pitch with $4\frac{1}{2}$ in. width of face. The gear shafts are supported in taper roller bearings, and lubrication of the gears is by a self-contained system supplying a flood of oil to all contact surfaces. The transmission is located directly back of the front truck and drives to both trucks.

It is stated by the manufacturers of this car that where there is a solid or rigid driving connection to two driving axles, considerable loss of power occurs as a result of the fact that the two axles will tend to revolve at slightly different speeds. This loss, it is stated, may be as much as 30 per cent. In the Smalley this loss is said to be eliminated by means of a special arrangement which does not deprive it of the advantages of the two-axle drive.

From the transmission a tubular propeller shaft incorporating two metallic universal joints transmits the power to the inner axle of each truck. That is, of course, there are two such propeller shafts, one extending to each truck. At the center of each driving axle there is a double gear combination, the power passing first through a pair of bevel or miter gears and then through a pair of spur gears with slightly helical teeth. These final drive helical gears have 3 diametral pitch 5-in. face teeth with a helix angle of $7\frac{1}{2}$ deg. These gears are hardened and are enclosed in a housing on the axle which is so arranged that a pair of gears may be replaced without taking the axle apart.

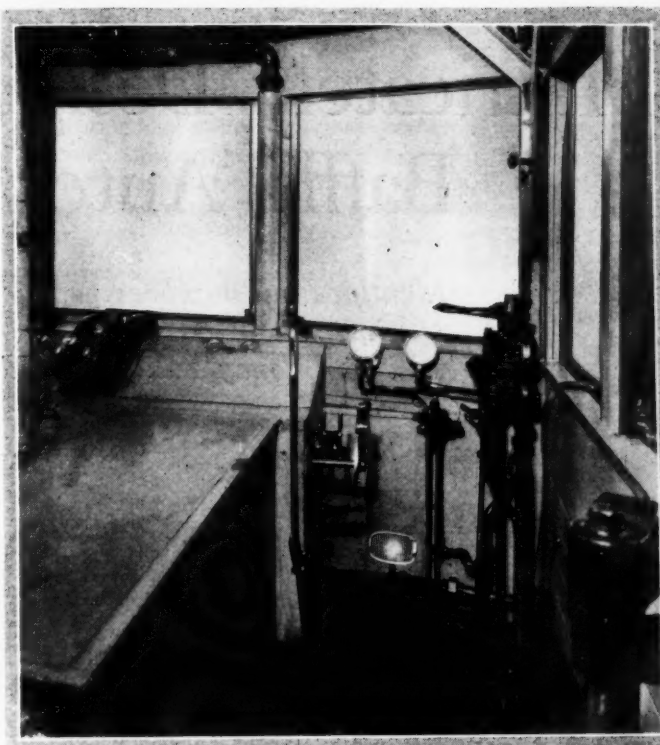
Fuel is carried in two 35-gal. seamless steel tanks located under the frame near the center of the car and is fed to the carburetors through a vacuum feed system of large capacity. There is a separate gasoline line to each engine, and the two tanks are connected together by an emergency by-pass. Ignition is by high tension magneto with impulse starter.

Radiators Set in Front of Car

Two radiators are fitted, one for each engine. These are of the cast tank sectional type and are built into the car body. A 12-gal. reserve tank always keeps both radiators completely filled with water. Starting of the engines is effected by 32-volt electric starters, one for each engine. Current for starting is derived from the lighting battery and the starters are operated by the engine control levers.

The truck frame is a one-piece steel casting with pedestal jaws. In order to make as much as possible of the total weight available for traction purposes, the trucks are set off center, so that about two-thirds of the weight comes on the driving axles and only one-third on the non-driving axles. Rolled steel wheels of 30 in. dia. and with M. C. B. tread and flange are fitted to 4-in. vanadium steel axles. The cast steel journal boxes are equipped with taper roller bearings and bear against hardened steel shoes in the pedestal jaws. Resting on the journal boxes are double side bars on which are mounted helical springs connecting to the truck frame. Connection with the car body is through a swing bolster with full elliptic springs.

A Westinghouse straight and automatic air brake is fitted, with the engineer's valve at the driver's right and the conductor's valve in the rear vestibule. A 12 to 1 ratio hand-brake is also provided, and is operated by a drop handle located convenient to the driver. The air brake rigging is unusual in that a 12 by 6 in. cylinder is mounted



View in operator's compartment, showing control devices

on each truck and is operated by a common triple valve. This eliminates a considerable amount of weight which otherwise would be represented by the foundation rigging and is claimed to also enhance the safety of the car, as it can be stopped by either truck.

SOME time ago we printed in the news section an item to the effect that Morris Motors, Ltd., of England, had acquired the Leon Bollee factory in Le Mans, France, and were going to manufacture in that country. This step followed a similar one by Andre Citroen, the French manufacturer of small cars, of securing a plant in England, which in turn was the result of the re-application of the McKenna duties in Great Britain.

In connection with the above some interest attaches to a notice printed in a French contemporary to the effect that Morris-Leon Bollee is a French company which is operating the old Leon Bollee works at Le Mans. The general management of the engineering as well as the sales department is at Le Mans and the Paris headquarters at 125 Avenue des Champs Elysees are temporary only. This firm, contrary to rumors which have been circulating, has not the intention of manufacturing a cheap vehicle, but to continue the Bollee line with a car of 122 cu. in. displacement and to supplement this model with a lengthened chassis of the 12 hp. type.

DURING 1925 a French economic mission under the chairmanship of Henry Ader and organized by the Minister of Commerce and Industry in cooperation with the leading French industrial organizations, visited Japan, with a view to studying the prospects for the sale of French manufactured goods in that country. At the present time the proportion of the Japanese imports which originate in France is very small. In 1924 the French share in Japanese imports was only 2.3 per cent, as compared with 50 per cent for the U. S., 27.9 per cent for Great Britain, 12.7 per cent for Germany and 3.8 per cent for Switzerland.

Intricately Designed Number Plates Baffle Automobile Thieves

Identification numbers produced by Fedco System and fitted to instrument board are more difficult to counterfeit than money and removal can't be "covered up."

By K. W. Stillman

PREVENTING theft of automobiles by definitely decreasing the market for stolen cars because of the ease with which such cars can be identified is the method employed by the Fedco System of automobile theft prevention and detection.

Essentially, this system consists of keyed number-plates which can be neither altered nor removed without easy detection and which the Underwriters' Laboratories said in their official report, are "more difficult to counterfeit than money." These plates are attached to the instrument boards of cars, in a position which is easily accessible for checking by police or others, and where evidence of attempts to alter or remove the plate is readily visible.

In addition to these mechanical protections, cars using the Fedco system are provided with a field protective service through an arrangement with the Wm. J. Burns International Detective Agency by which the Burns organization acts as a clearing house for all information relative to stolen cars, obtains full cooperation of police bodies in detection and arrest of car thieves and is active in their prosecution.

During 1921 theft losses on automobiles became so great that the various bodies representing the industry interested themselves in the problem of how car thieves might best be blocked. The National Automobile Chamber of Commerce called upon the Society of Automotive Engineers to solve the problem by the development of some method of labeling a car so that if it were stolen it could not be disguised to look like a legitimate automobile.

A number of methods were devised for providing unalterable car numbers and



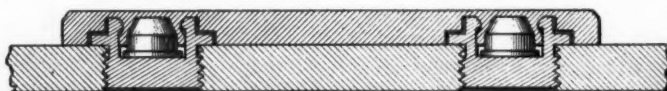
Fedco number plate showing intricate design used to discourage counterfeiting

were submitted to the Underwriters Laboratories for tests. The standard test which was developed by the Laboratories was quite severe. A car thief was allowed four days of eight hours each in which to work on the car. He might have a completely equipped machine shop at his disposal and could spend \$1000 for any special tools which might assist him. If at the end of the period he had altered a single digit of the car number so that it would pass the inspection of a patrolman without arousing suspicion the device was rejected.

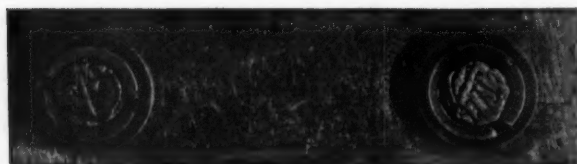
Among those who took up the work of developing such a numbering system was the Federated Engineers Development Corporation. After a long development period the present Fedco system was perfected and submitted to the Underwriters Laboratories for test. At the end of the four-day period allowed by the standard test the plates were still undefeated but the laboratories continued over a period of five months and when the number plates still were undefeated they approved the system.

By combining two metals, copper and a white metal, a plate is produced on which the digits of the numbers stand out clearly in the highly polished metal against a background of oxidized copper. The embossed face of the plate carries a design characteristic of the make of the car to which it is attached. This design covers the entire face of the plate but the figures making up the serial numbers are woven through it and these figures are embossed in relation to the design although traversed by it. The name of each digit is spelled out above and below the numeral.

In mounting the plate on the instrument board the



Sectional view of a Fedco number plate attached to a car. Note the screw plugs screwed into the steel plate and the taper plugs inside them which have expanded the metal of the number plate and caused it to lock under the shoulders of the screw plugs



These views show what happens when an attempt is made to remove the number plate. It is mutilated beyond repair

metal panel of the latter is formed with a rectangular depression the size of the number plate and two holes are punched through the panel where the depression is located. A second plate, of steel, with two threaded holes which extend part way through it, is secured to the rear of the panel depression by means of two screw plugs. These plugs are drilled out at the ends toward the number plates and a taper plug is placed in the hole so provided.

Two holes are drilled in the number plate from the rear side to within 1/32 in. of the face of the plate and an annular hole is formed around this drill hole so as to leave a thin cylindrical shell of copper—the metal making up the base of the number plate. When the number plate is assembled to the instrument panel the screw plug passes over the thin shell of copper while the taper plug inside the stud enters the shell. When the plate is forced into position the ball expands the shell causing it to flange over behind a shoulder in the bore of the screw plug, thus rigidly and permanently securing the number plate to the instrument board.

Since the front of the number plate and the rear of the steel plate to which the number plate is fastened are quite solid, the only possible means of removing the number plate is to pry it off. When this is tried the point of failure is directly over the two holes where the thickness of the number plate has been reduced to 1/32 in. and the plate is mutilated beyond repair.

The stealing of a car equipped with a Fedco number plate becomes rather embarrassing to the thief. He cannot successfully alter the numbers; he cannot remove the plate without leaving tell-tale evidence; he cannot counterfeit the plate or secure a new one; and the absence of the number plate is obvious evidence that it has been stolen.

The professional receiver of stolen cars is handicapped in his work as much as the thief because of these conditions and so probably will not be desirous of handling cars which can be traced so easily. The innocent purchaser of a car is safeguarded because if the number is intact he can quickly learn if it has been stolen and if the number plate has been removed or tampered with he can feel quite sure that the present possessor of the car has not a clear title to it.

Can't Plead Ignorance

To the willing purchaser of "bargains" in cars of hazy history, Fedco number plates represent a difficulty not only in making it probable that a stolen car so equipped will be identified sometime and taken from him, but also that he will have little success in pleading that he was ignorant of the fact that he was buying a stolen car.

In connection with the field service provided through the Wm. J. Burns International Detective Agency, which has branch offices in 30 cities throughout the country, every car owner receives with his new car instructions directing him, if his car is stolen, to notify not only the police and insurance company but also the nearest Burns agency. Through its branch offices the agency then broadcasts an alarm on the stolen car to municipal police departments, State police forces, Federal operators, members of the

National Automotive Dealers Association and to an extensive list of garages, service stations and filling stations.

Because of the prominence of the Fedco number plate on the instrument panel the task of checking such cars of the make stolen as come under the notice of these various agencies is quite simple and effective.

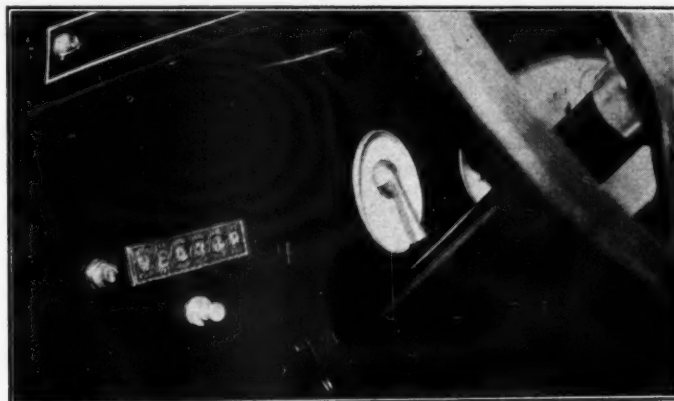
Believing that apprehension of the thief and recovery of the stolen car is not enough the Fedco Number Plate Corporation is interested in obtaining conviction of automobile thieves and offers \$5000 in rewards for information leading to the arrest and conviction of persons who have stolen or are responsible for theft of cars protected with its number plates.

Fedco number plates have been standard equipment on all Chrysler cars since July 1, 1925. Upon arranging with the Fedco Corporation to provide as its agents a field service for the Fedco System, the Burns agency made an investigation to determine the effectiveness of the system.

They learned that during the period July to November inclusive, 1925, nearly 30 per cent more Fedco equipped cars were recovered in comparison with the recovery experience on Chrysler cars not so equipped in the same period of 1924.

The Fedco System has been adopted by Stutz for installation on all Stutz cars. This company's belief in the efficacy of these number plates is evidenced by the fact that it intends to equip with plates without charge, all its Vertical Eight models which have already been delivered to dealers or to the public.

Two other well-known manufacturers have recently adopted the Fedco System and cars of these makes will shortly be equipped with these number plates.

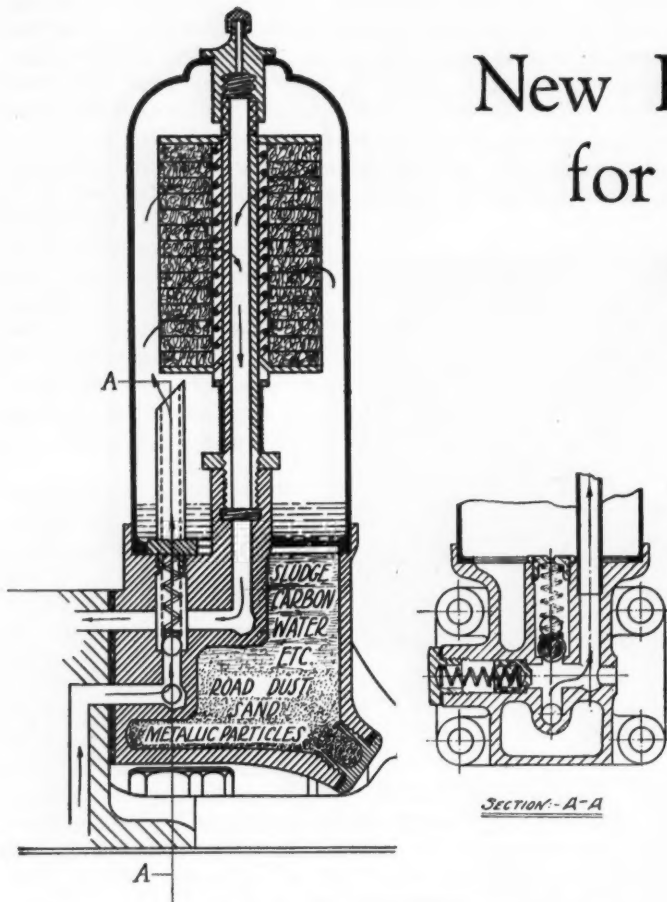


Fedco number plate installed on the instrument board of a Chrysler car in plain view of the driver and officials checking up stolen cars

THE first month of the year showed a material increase of French automobile exports over the corresponding month of last year, accompanied by a decrease in the imports of the same kind. During the month of January, 1926, there were imported into France automobile, parts and accessories weighing 15,191 double hundredweights and representing a value of 11,939,000 francs, as compared with 19,644 double hundredweights valued at 11,559,000 francs during January, 1925. Of the cars imported during January, 1926, the largest number, 84, came from Italy; 57 came from the United States, 12 from the Belgian-Luxembourg Customs Union; from England 9, Germany 5.

French exports of automobiles and parts during the first month of the year attained 68,067 double hundredweights valued at 204,013,000 francs, as compared with 63,510 double hundredweights valued at 185,710,000 francs in January, 1925. Among the principal customers of the French industry during January, with the number of cars taken by each, were the following: Belgo-Luxembourg Customs Union, 180; Spain, 592; Great Britain, 19; Algiers, 490; Switzerland, 281; Indo-China, 190; Netherlands, 149; Morocco, 140; Argentina, 88; Italy, 78; Germany, 67; Portugal, 65; Czechoslovakia, 47; Madagascar, 33; Japan, 25; Tunisia, 23.

New Engine Oil Filter Built for Quick Cleaning by Compressed Air



Cross-section of H-W oil filtrator. Sludge, carbon, water, etc., can be blown out by attaching ordinary tire air hose to valve provided for that purpose at top

AN OIL filtering device, designed primarily to be "built-in" and permanently attached to an engine, and a filter type air cleaner have been placed on the market by the Rich Tool Co., Detroit. These units, known as the H-W-Filtrators for oil and air respectively, were developed by Col. E. J. Hall and Chas. A. Winslow. For the replacement market a modified form of oil filter is provided for mounting on the dash, which, however, operates on the same principle.

The H-W-Filtrator for oil is now standard equipment on all Fageol safety coaches and is also fitted to Hercules engines supplied to several truck manufacturers. Owing to its size, the air filter is restricted to use on trucks, buses, tractors and industrial engines.

One of the features of the new oil filter is that no parts have to be renewed or replaced during the life of an engine, and it is claimed by the manufacturers that the crankcase oil need not be drained at all if directions are followed for cleaning the filter. After two or three thousand miles, the drain plug on the filter should be unscrewed and the sludge, carbon, dirt and water blown out by holding an ordinary tire air hose connection to the valve on the top of the filter. This also cleans the filtering medium.

As will be seen from the section, oil enters the filter proper through the short pipe and fills up the interior of the device. Under pressure from the engine oil pump, the lubricant is forced through the filtering medium, and it then enters the central tube, which leads it to the main bearings of the engine.

The filtering medium consists of from 15 to 20 felt washers compressed between two steel disks by a coil spring exerting a pressure of 80 to 100 lb. The pressure and

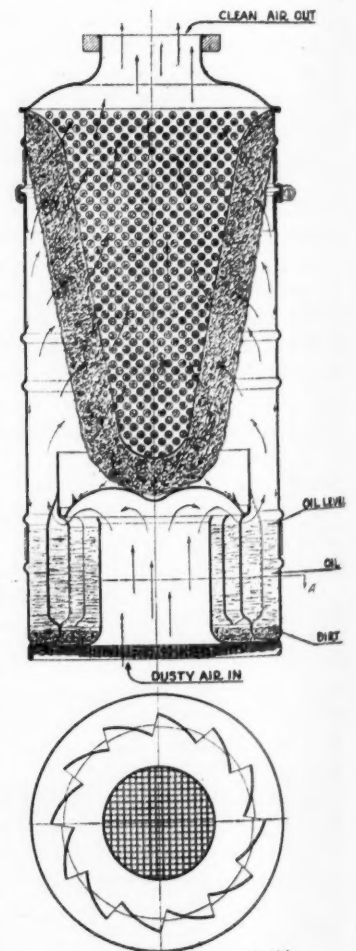
Foreign matter collecting in H-W-Filtrator can be blown out. New air filter also introduced by Rich Tool Co.

the number of washers are governed by the size and design of the filter. In penetrating the felt washers, the oil leaves an asphaltic or tarry deposit on the outside of the felts, and the heavier particles finally drop into the drain sump which has a large capacity. Water globules reaching the filtering material also run into the sump. If the filter should become inoperative due to neglect to clean it, a by-pass valve at the base of the inlet opens and allows the oil to pass directly to the bearings.

The drawn steel shell which encloses the filter unit is held against a cork washer at the base by a large nut screwing upon the central tube supporting the compressed felt washers. Into this hold-down nut is built an air valve which allows the air pressure to pass through the holes in the tube and come out through the felt, bringing all foreign matter with it. To clean the filter, the drain plug and the dust cap on the air valve are unscrewed and the air pressure is applied.

In the H-W-Filtrator for air, oil is mixed with the air before it passes through the filtering medium on its way to the carburetor. Over a quart of ordinary engine oil is contained in the circular reservoir. Air enters through a 3 in. opening at the bottom and in passing through lowers in the curved baffle plate, is deflected so that it comes in contact with the oil. A coarse wire screen across the aperture prevents leaves and similar matter being drawn in.

The air-oil mixture is drawn through an inverted cone shaped filter composed of hair compressed between inner and outer inverted cones



H-W air filtrator. Oil is used to facilitate the filtering process

of perforated sheet steel. The air mixture in passing through the hair rids itself of the oil and dirt particles, which run down the outer perforated cone into a trough, whence they drain back into the reservoir. By loosening a screw near the top of the cleaner, the entire covering of the filter may be removed, exposing the filtering medium. The sediment can then be removed and fresh oil introduced. An efficiency of 99.9 per cent is claimed for the filter.

Brake With Wrapping Action

A NEW type of brake, particularly designed for use on heavy vehicles requiring the expenditure of considerable muscular energy in the application of their brakes, has been developed by E. B. Flanigan, of Wilkes-Barre, Pa.

This brake differs from the usual design in that the ends of the shoes opposite the cam float. Referring to the drawing, they are connected by short links G and F to another link E which is pivoted to the brake spider S. A feature of the brake is the differential cam C, the shaft of which is supported in a bearing in the brake spider. It will be observed that the upper lobe of this cam has less throw than the lower lobe. By spreading the shoes by means of the cam, a sort of toggle effect is produced at the links on the opposite ends of the shoes and the latter are firmly pressed against the drum.

Anti-Rattle Springs

The upper shoe is supported on the brake spider through the eccentric H, and supporting surfaces M on the brake shoes are drawn against corresponding surfaces on the brake spider by anti-rattle springs N. At the cam end of the brake shoes there are similar anti-rattle springs P which are held in place by small rods resting in grooves in the shoes. The eccentric is adjustable from the outside, whether the brake is open or enclosed by a dust shield.

In assembling the brake, cam C is rotated until both shoes are in contact with the drum. Nut K is then loosened, and the eccentric support H is rotated until it is in contact with the upper shoe. The support is then backed off slightly and nut K tightened. This is said to be the only adjustment required.

After the brake lining has worn down a certain amount, the brake can be readjusted by means of the eccentric support. The brake can be easily removed for relining. All that is necessary is to unsnap the anti-rattle springs N and P and remove the cotter pin in the hinge pin D. The whole shoe and link assembly can then be lifted off. The two shoes are interchangeable and it does not matter which of them is placed on top when re-assembling.

Owing to the differential form of the cam, the equivalent of a wrapping action is obtained when braking against forward motion. The spreading action of the cam, of course, depends upon the combined wedging actions of the two halves of the cam, while the drag on the brake acts on the cam only through the upper portion of the latter, with an exceedingly small leverage around the cam axis.

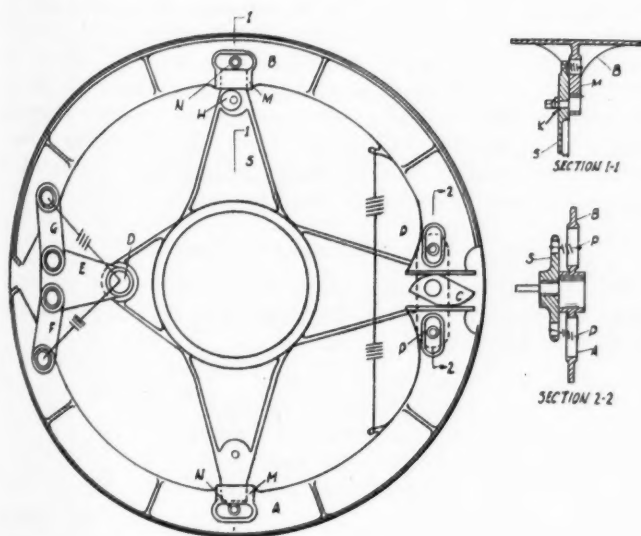
Aviation Progress in Russia

ALTHOUGH only incomplete data is available, it is evident that Soviet Russia is very active along aircraft lines. At present there are nine airplanes in operation covering a total distance of 4885 kms. The rapid increase in air transportation is evidenced by the fact that one of these operating companies alone, the "Deruluf" Company, had a greater number of miles flown to its credit during 1925 than all the Russian airlines together in 1924, carrying 170,994 kilograms of freight and 1741 passengers over a total distance of 470,886 kms.

A number of aero clubs have been organized, one of these, the Society of Friends of the Air Fleet, having in its treasury 6,000,000 gold rubles, 2,000,000 of which are being diverted to the construction of 87 planes for the army. This society has equipped 13 aerodromes and 29 flying fields. In addition, it is carrying on 14 courses of instruction and is composed of 12 large clubs and 400 libraries.

It is not known how many aircraft manufacturers there are in Russia at present. The Obukhov Works in Leningrad, however, have been organized to manufacture advanced designs of aircraft motors. A trial flight with one of these engines was made recently from Moscow to Peking, showing excellent results.

A number of new lines to be established during 1926 have definitely been decided upon according to press reports.



Flanigan mechanical brake. Assembly and detail views at left

Aluminum Castings Made in Permanent Molds by Five Processes

For machine parts, castings made by the pressure and gravity processes are most suitable. Former greatly developed in U. S. in die-casting art. Gravity castings most widely used abroad.

A REVIEW of practice in making what we in this country call permanent mold-castings, but what in England are referred to as die-castings of aluminum alloys, was made in a paper read by George Mortimer at the meeting of the Institute of Metals at London recently. The author points out the great advantage of casting in permanent molds, which has led close and costly attention being given to the permanent mold-casting of brass and bronze recently, while in America at least one concern is making iron castings by this method.

With aluminum alloys the process is carried out with greater facility and the molds cost less and last longer. The development in the use of permanent mold-castings has been somewhat different in Europe and America, but has been remarkably rapid during the past decade, and the object of Mr. Mortimer's paper was to crystallize the ideas of those interested in this class of castings.

Many Light Alloys Available

A great array of light alloys is available, but the range of physical properties is limited, the only noteworthy exceptions being the silicon and silicon copper alloys, which have properties of distinct value to the worker in permanent molds. Troubles with permanent mold castings hinge notably on crystallization shrinkage and on low physical properties at the freezing range. The silicon alloys, with their low solidification shrinkage and high elongation at high temperatures, stand in marked contrast to the more widely used alloys and assure a certain freedom from many of the minor troubles associated with the process. Aluminum casting alloys to B. E. S. A. specifications have the advantage that they are well-known to designers and have been tried out under widely varying service conditions.

The properties of the B. E. S. A. standard alloys are given in Table I. Although the following notes deal primarily with these alloys, it may be said that they apply equally to the silicon group or to any light alloy capable of being cast in permanent molds.

Easily the most popular alloy for general die-casting purposes is the one containing from 7 to 8 per cent copper, and known in Great Britain as 3L11. In the United States, under the well-known name of No. 12, this alloy comprises 90 per cent of the enormous output of aluminum castings for general engineering purposes, whether cast in sand or in dies. A higher copper content gives a hard-wearing machined surface, eminently suited for such parts as automobile pistons. Additional copper also slightly decreases the total shrinkage and the general tendency to porosity. The indiscriminate addition of copper, however, brings its own penalties in a rapidly increasing brittleness, and in an increase in weight out of proportion to any gain in strength. To guide founders and design-

ers alike in the matter, therefore, we now have the specification 2L8, standardizing a content of 12 per cent copper—an alloy which still holds its own in popular esteem for automobile pistons.

The copper alloys have a material advantage over those containing zinc in their relative ability to withstand high temperatures. All zinc containing alloys are weak at high temperatures, and specification 2L5 should never be used for pistons. 2L5 is an alloy, however, which has for twenty years been established as a reliable material in England, and it is used for crankcases and other stressed parts where Americans would normally use the straight copper alloy. In spite of its weakness at high temperatures, this alloy has been found to give excellent die-castings.

L24, better known as "Y" alloy, can no longer be regarded as a newcomer either as cast or forged. As a die-casting alloy it gives little trouble once its properties are understood, and the castings produced are peculiarly white, clean and close-grained, giving a beautiful machined surface. "As cast" its properties hardly justified its relative cost, except possibly in the case of pistons, where the excellent frictional and thermal properties of the alloy offer advantages which, taken as a whole, are not yet equalled by those of any other standard light alloy.

L24 is not intended to be used, however, in the "as cast" condition. It is primarily an alloy the properties of which are brought out by subsequent heat-treatment, and the close-grained structure found in a carefully poured permanent mold casting is pre-eminently suited to the conditions governing the consistent success of that heat-treatment. Permanent mold-castings in "Y" alloy, intelligently heat-treated, offer the nearest approach yet to duralumin, and they are being used to a rapidly growing extent in England and other countries, wherever something approaching the strength and fatigue value of a forging is sought and a forging is impracticable.

Five Methods are Used

Of the many possible methods of obtaining castings from "permanent" molds, there are five of interest to the worker in aluminum. They are:

- (a) Slush casting.
- (b) Gravity casting.
- (c) Centrifugal casting.
- (d) Cothias casting.
- (e) Pressure casting.

Slush casting is the simplest of all methods, and dates from the first moment that vendors of idols and charms realized that those articles need not be of solid metal. The mold is generally made of cast iron, and is cut to the contour required by the outside surface of the casting.

Metal is poured in at the top, the mold is almost immediately inverted, and the greater part of the metal poured out again. That metal which comes in contact with the mold surface has meanwhile set; it does not run out again, and so a hollow casting is obtained at very little trouble and with an excellent external finish.

Gravity casting is a natural development of the above. Permanent mold cores are provided as in sand-castings; as in sand practice, also, the metal must set between the walls of mold and core. Therefore, since it freezes first in actual contact with these walls, it follows that there is a period during which there are virtually two castings, one within the other, with the space between them filled with molten metal. That molten metal must be fed as it freezes in turn, which means gates and risers and all the refinements associated with sand-casting.

That is the first point at which gravity mold-casting differs from slush-casting. The second is that from the gravity mold one obtains an engineering structure of reasonably accurate dimensions, possessing physical properties reasonably comparable with those obtained from the standard chilled test-bar. Extreme accuracy is seldom attainable in this form of die-casting. Accuracy, however, is here a loosely applied term; this process is so much more accurate than sand-casting, and possesses so many other desirable features, that its field of utility in engineering is a very wide one.

The pressure exerted by gravity in the case of so light a metal is almost negligible, and about 90 per cent of the art of producing clean-cut, sound castings by the gravity mold process lies in considerable care in the design and adjustment of gates, risers and vents.

Once a gravity mold has been worked into condition, castings may be turned out *ad lib.* by practically unskilled labor, with little subsequent trouble and very little cost per casting. Many of the troubles connected with accuracy,

clean finish, the complete running of the more intricate shapes, and so on, are directly associated with this problem of the very low pressure available. It was natural, therefore, that engineers should early turn their attention to some form of artificial pressure, whereby the mold could be filled by force, and soundness and clean definition seemingly assured.

The simplest form of artificial pressure is that of centrifugal force, and its simplest application is seen in the production of close-grained, cylindrical castings, for machining into piston rings of either cast iron or one of the modern light alloys. The commonly employed apparatus consists of a hollow cylinder mounted horizontally on a spindle. The cylinder has an internal diameter corresponding with the exterior dimensions of the required casting, and the thickness of the latter is set by a flange at either end of the cylindrical mold. Metal is poured in while the mold is rotating on its spindle at high speed, and centrifugal force causes it at once to conform to the internal contour of the mold. Excess metal flows out over the flange at the end, and rotation is continued until the metal has set, when a cylindrical casting of peculiarly dense and even grain is removed from the mould.

The Cothias System

In the Cothias system a measured amount of metal is poured into the mold, which is cut to the contour called for by the exterior of the required casting. A plunger having the contour of the interior of the casting, and taking the place of the usual core, is immediately brought down into the mold by a species of power press. The metal is thus forced under considerable pressure to take up a position between mold and core, and to enter the finest corners. The metal sets, the plunger is raised, and the result is a clean-cut casting of dense structure.

This process, as distinct from the previous ones, is true

TABLE I

Specimen No.	Specified Chemical Composition.	Percentage Specified Impurities not to be Exceeded.					Minimum Tensile Properties called for under the Specification Conditions.*		Average Tensile Properties Obtained under Those Conditions.	
		Iron.	Silicon.	Lead.	Zinc.	Tin.	Ultimate Tensile Strength. †Tons per sq. in.	Elongation. Per cent. on 2 in.	Ultimate Tensile Strength. †Tons per sq. in.	Elongation. Per cent. on 2 in.
3L11	Copper not less than 6 per cent nor more than 8 per cent Tin may be present up to 1 per cent Aluminum the remainder	0.80	0.70	0.10	0.10	..	Not less than 9	Not less than 3	11 to 13	4 to 6
2L8	Copper not less than 11 per cent nor more than 13 per cent Aluminum the remainder	0.80	0.70	0.10	0.10	..	Not less than 9	Nil	11 to 12	1 to 2
2L5	Zinc not less than 12.5 per cent nor more than 14.5 per cent Copper not less than 2.5 per cent nor more than 3.0 per cent Aluminum the remainder	0.80	0.70	0.10	..	..	11	3	14 to 16	6 to 10
L24	Copper not less than 3.5 per cent nor more than 4.5 per cent Nickel not less than 1.8 per cent nor more than 2.3 per cent Magnesium not less than 1.2 per cent nor more than 1.7 per cent Aluminum the remainder	0.80	0.70	0.10	0.10	0.10	As Cast.* Not less than 11 Heat-Treated. (No specification yet issued)	..	As Cast. 11 to 13 Heat-Treated. 17 to 22	1 to 2 3 to 6

* (a) The aluminum used for the above alloys shall be virgin metal. The copper shall assay not less than 99.3 per cent. The nickel shall assay not less than 99 per cent. The zinc shall assay not less than 99.5 per cent.

(b) Test-bars 1 in. in diameter and 7 to 9 in. long, cast in iron chills which have been heated before they are filled. The bottom of the chill closed with a sand or clay plug.

† British ton of 2240 lb.

die-casting, in that the metal is positively forced to take the dimensions of an accurately cut die. The result is a casting having a finish and a degree of accuracy which calls for little or no subsequent machining. Having a parallel with the draw-press of sheet metal work, however, it combines much of the latter's speed of working with its essentially limited field of utility. The Cothias process produces great numbers of accurate and beautiful castings of relatively open design, but is limited to castings of that type.

Under the heading of pressure casting comes that vast array of patents covering some means of applying external pressure to the metal, and forcing it to pass through gates into the mold. The essential difference here is that no part of the mold moves in order to bring about that pressure. The mold is built up ready with its cores in position, just as in the gravity poured casting, but the pressure due to gravity is enormously assisted by artificial means. It follows that the system is at least as widely applicable as that of the gravity mold, as far as the production of intricate shapes is concerned.

Compressed Air as Plunger

Many of the earlier designs of apparatus incorporated some form of piston or plunger which forced the molten metal through the gates. This principle, developed on varying lines, has always been satisfactory in the case of the heavy zinc- and tin-base alloys. In the case of aluminum it is handicapped by the difficulty of finding a material for the piston which would withstand the action of molten aluminum under pressure. Metallic plungers were therefore gradually abandoned in favor of one of compressed air, and machines employing this flexible medium are now very widely in use.

In this process air under considerable pressure is brought to bear on the surface of the molten metal at the right moment; the metal is shot into the die and immediately solidified; the cores are withdrawn, the sprues cut, the mold opened and the casting ejected, all by means of cams or pistons operated by compressed air, steam, or hydraulic pressure. The mold and cores are reassembled by the same means, either by the movement of a few simple levers, or more or less automatically; the degree of development is set mainly by economical considerations, the number required from a given mold, the output allowable, the price obtainable for each casting.

On these broad lines pressure casting has been developed very extensively in America, notably by the Doehler and Acme interests, who have brought the art of rapid production of accurate castings to a high standard of excellence. This system again is true die-casting, in that it produces substantially finished castings, in the majority of cases absolutely ready for assembly. It is at least as widely applicable as gravity mold work, and it produces castings of markedly more accurate dimensions.

Limits of Pressure System

Limits of this system of casting aluminum alloys are tabulated in the data sheets of the Doehler Die-Casting Company as under:

Maximum Weight for Castings—5 lb.

Minimum Limits for Wall Thickness—1/16 in. for small castings, 1/8 in. for large castings.

Variations from Drawing Dimensions—0.0025 in. per in. of diameter or length.

Maximum Number of Threads—External threads 20 per in., cast oversize 0.01 in. to be chased to size. Internal threads not cast.

Holes—0.093 in. minimum, and not deeper than 1 in. Smaller holes can be spotted to facilitate drilling.

Draft—Cores 0.015 in. per in. of length and diameter. Side walls, 0.005 in.

Cores less than 1/4 in. diam. to have 0.005 in. per in. of length and diameter.

Design Features—Sections of castings should be as uniform in thickness as possible. Large fillets and thin sections are most desirable within above limits. Undercuts in castings should be avoided wherever possible.

The above limits are quoted from the recommendations of a firm mainly responsible for bringing the art of die-casting in aluminum to its present high standard of development. So much is written on the extreme accuracy of die-castings, and so very much of that is exaggerated, that a word of warning on this will not be out of place.

It is quite true that many millions of aluminum die-castings are produced having a degree of accuracy quite unobtainable on sand-castings, and entirely adequate for the job in hand without any machining whatever. From the above, however, it will be quite clear that the time is not yet when parts like the crankcases of airplane engines or the breech-blocks of naval guns can be cast dead to gage, with all holes, screw threads, oil-ways, etc., ready for assembly. There is one obstacle to absolute accuracy which is not very widely appreciated, and that is the contraction which takes place in the casting after it is taken from the mold—a contraction which may be calculated to a nicety in the case of a solid straight test-bar, but which tends to vary throughout the different sections of an intricate casting. This factor gives rise to minor distortions in the casting on cooling—distortions which are difficult either to foresee or to counteract, and which are unaffected by the most accurate work put in on the die.

The casting in of screw threads is yet another point. Most customers tend to press for this feature, without considering that the removal of a threaded core may double or treble the time of production of any one casting, and introduce all sorts of complications in a casting which should be removable in a few seconds. The cost of this is almost invariably more than that of a rapid tapping operation in a hole already cast to tapping size, and the extra cost inevitably comes on the customer.

Process Has Limitations

Die-casting in any of its approved forms can be guaranteed to save a great deal of costly machining and finishing, and in a great number of applications it cuts out all operations other than mere assembly. The process has its limitations, however, just like any other. It can never entirely supplant sand-casting in general engineering, nor can it yet attain the precision of a machined part on any but relatively small and simple parts. A due recognition of these present limitations will assist to an intelligent development of the undoubted economical potentialities of die-casting generally.

Now of the five classic methods briefly reviewed above we may reject three. Slush casting is not an engineering process, though a useful and economical string to one's bow in the case of decorative parts. Centrifugal casting is supreme in its distinct field, but this is necessarily a limited one. The Cothias process, economical and accurate enough, is confined by its very nature to castings of relatively open shape.

There remain the gravity and the pressure systems, and the choice between one or the other depends on a variety of factors, which may conveniently be considered under the broad headings of technical and economical aspects.

It seems on the face of it that the pressure casting must logically be the sounder. The fact is, however, that a gravity poured casting is superior from the point

of view of metallurgical structure to one produced by the pressure machine, and reasons for this are not far to seek. In the case of a gravity mold, the relative temperatures of metal and mold, the rate and the direction of pouring, may be so regulated that the casting freezes more or less progressively as the mold slowly fills. Each layer as it freezes can be automatically fed by the fluid layer above, and this factor can do much to counteract any evil effect of crystallization shrinkage on the strength of the subsequent casting. Contrast this freedom of pouring, these elastic conditions, with the case where the metal is shot into the mold and instantly solidified while still in a turbulent condition. As in the case of the gravity mold, the metal in contact with the walls of the mold freezes first; but here there is little to feed the space between what are virtually two thin castings, one within the other. Metallurgically the space between sets to an open, porous structure.

Similarly in regard to gas occlusion. In both gravity and pressure casting practice the tendency is for the metal to absorb rather more gas than would be accepted as good practice in a sand foundry. The pressure system tends, if anything, to encourage such absorption by reason of the air pressure applied periodically to the surface of the melt.

Vents Provided for Air

The air within the mold is taken care of in both instances by the provision of adequate vents. The latitude in gating and pouring offered by the gravity system necessarily implies a more thorough escape of this air as compared with the high velocity entry of the metal under artificial pressure, but this is an aspect which may well be overcome by ingenuity in design of the pressure die.

The most considered venting, however, will not help matters in regard to the gases occluded within the metal itself. These gases tend only to leave the metal as it freezes, and by that time every vent in a pressure die is effectually sealed by a thin but relatively impervious wall of solidified alloy; and so the gases remain within the casting. In the case of a correctly poured gravity casting gases have more time to come off progressively at the rising surface; that they do so is indicated by the marked difference in the fracture of such castings as compared with those from pressure machines.

To sum up, gravity castings, when gated and poured, with due care in regard to first principles, may be recommended for stressed parts in preference to sand-castings in the same alloy. In the present state of the art it is doubtful whether pressure castings could be so recommended without reserve, and this in spite of the admitted advances made possible by the development of new alloys of lower crystallization shrinkage, notably of the silicon group.

The question naturally arises as to why, if this is so, pressure castings are turned out at the rate of many millions daily; so much so that the tonnage from one or two large firms in America alone might well equal the tonnage produced by most of the gravity mold founders in England. The reply is that for a vast range of industrial parts academic considerations of strength simply do not count. All that is aimed at is a light, rigid part, of adequate strength for the job in hand and calling for little or no subsequent work. This is just what is offered by the pressure casting; no more, and certainly no less.

Technically speaking, gravity and pressure castings cater for two quite distinct fields in industry, although these fields necessarily overlap to a considerable extent. On stressed work gravity casting comes into its own;

but to many thousands of parts pressure casting is pre-eminently suited on the grounds of economy, rapid production, adequate strength, and a degree of consistent accuracy which cannot be maintained in a gravity mold. Where purely academic considerations of strength are subservient to these considerations, there is only one factor which need be considered in the choice between the two systems—that is, the number required regularly from any one mold, and this brings us to the question of economy.

Economically the pressure system starts with a heavy advantage in speed, accuracy, and the possibility of running thinner sections than are practicable in a gravity mold. It is economical in labor because most of the operations are effected by mechanical means, and in metal because both gates and actual sections of the castings are cut to a degree impossible when working only with gravity.

These advantages, however, are not obtained for nothing. The whole proposition of pressure casting hangs on the handling of sufficient numbers of castings to one design to warrant a heavy initial outlay. Pressure casting machines are costly items, and in addition to these must be added the capital cost of a well-equipped machine-shop on tool-room lines, for the production and maintenance of the necessary dies. These dies are in themselves exquisite pieces of mechanism, designed and constructed by experts, built up of sections and cores and slides of special alloy steels. These steels, selected with care by metallurgists, are heat-treated more than once in the process of manufacture, and tested again and again for minor flaws and cracks which, infinitesimal in themselves, may cancel much costly workmanship when subjected to the searching action of molten aluminum under pressure.

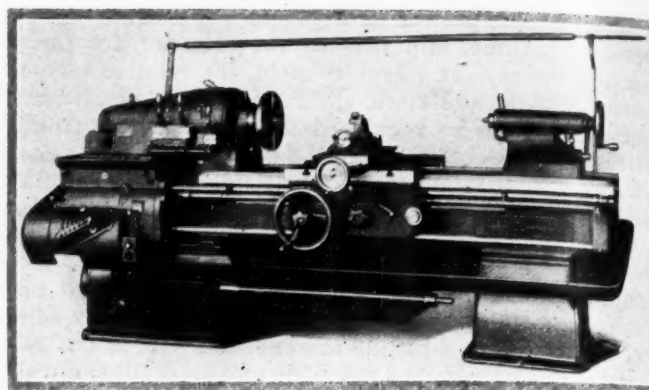
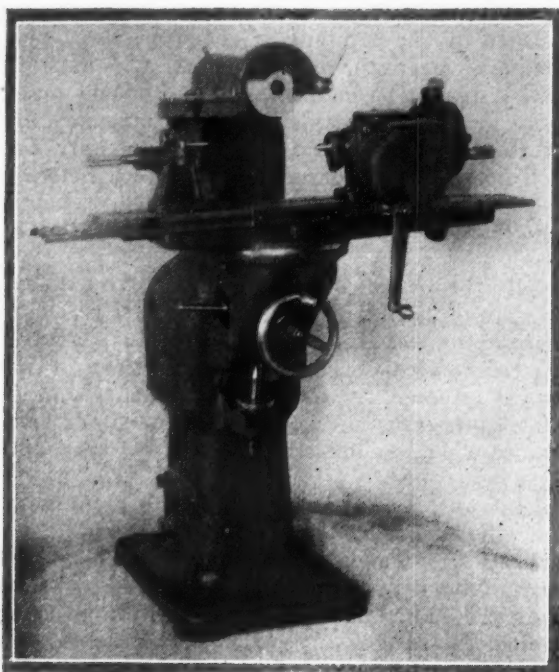
Against this the ordinary gravity mold, cast in a close-grained gray iron, finished in any average machine-shop to dimensions given on a rough sketch, is a mere bagatelle. Such a mold often enough costs little more than a set of first-class mahogany patterns and core boxes.

No Comparison in Cost

There is, in fact, little room for comparison between the outlay on a gravity mold and that on the highly developed die of a pressure machine. The former is justified on orders for a few hundreds off. For the same casting a pressure die would seldom be justified for orders of as many thousands, while the great pressure die-casting industries were in fact largely built up on orders running into the region of millions of castings from one fixed design.

It is mainly for this reason that England, lacking the demand for castings in vast numbers to one design, has tended to develop the undoubted usefulness of the simple gravity mold; while Americans, with their immense internal markets and their genius for quantity production, have brought the process of pressure casting to a very high art. There are wireless and telephone parts, household and automobile fittings, required in England in quantities which well justify the initial outlay on the pressure system. In few cases, however, do the quantities called for approach the numbers taken by the internal market of the United States.

LARGE scale graphs for computing the compressibilities of air, argon, helium, hydrogen, methane, neon, nitrogen and oxygen and for computing the volumes delivered from cylinders containing some of these gases at high pressures have been published by the Bureau of Standards as Miscellaneous Publication No. 71.



ABOVE: Pratt & Whitney Model B 20-in. lathe

LEFT: Pratt & Whitney hob and cutter grinder

Hob and Cutter Grinder and New Lathe Announced by Pratt & Whitney

Former adapted for sharpening all cutters which must be ground in the flutes. 20-in lathe added to B Model line.

A NEW grinder for sharpening gear and thread hobs, form milling cutters and particularly Pratt & Whitney Curvex cutters has been introduced by the Pratt & Whitney Co., Hartford, Conn. It is adapted for sharpening all cutters which must be ground in the flutes.

Motor drive is used, the electric motor being mounted inside the column on a hinged platform and driving to the wheel spindle by belt. For ordinary sizes of cutters a $\frac{3}{4}$ hp. motor and a $1\frac{1}{4}$ in. belt are used. The belt tension is adjusted by varying the height of the hinged platform supporting the motor by means of a screw.

Mounted on top of the cast column is the wheel head, which is dovetailed and gibbed. By means of a hand wheel at the rear of the slide the wheel is moved toward or away from the column so as to bring it into the proper relation to the flutes of the cutter. The wheel spindle is mounted in ball bearings and provisions are made for taking up the end thrust. Felt washers protect the bearings against grinding dust.

Norton Silicate Wheel

The wheel used is a Norton silicate wheel of 3836 grain and grade 1. It is trued to such an angle that it will clear itself when grinding a spiral fluted cutter. A suitable guard swings down over the wheel to protect the operator.

The truing device is in the form of a swinging bracket mounted on the side of the column, and is swung back out of the way while the machine is being used. When it is desired to true the wheel, the wheel guard is raised and the truing bracket is swung into position, where it

is held firmly by a pin. A truing bar is used, and pins on the truing slide provide locating points for obtaining the proper angle on the wheel. A setting gage, which facilitates exact setting of the truing slide, is furnished with the machine.

A new size has been added to the B Model line of Pratt & Whitney lathes. It is of 20-in. swing and supplements the other two sizes of this line, of 13 and 16-in. swing respectively, which are already well known to the trade.

Designed for Motor Drive

The new lathe is designed primarily for motor drive, and the manufacturers take particular pride in the motor mounting. By placing the motor in a cabinet leg beneath the headstock, it is entirely out of the way and, being unusually low, it does not cause vibration of the lathe. A $7\frac{1}{2}$ hp. motor is regular equipment and is installed with push-button control and low voltage protection. The lathe, however, may also be driven from a line shaft by belt to a single pulley.

The drive is carried by belt to the main drive shaft at the rear of the machine, and thence to the headstock and feed mechanism by gearing. A friction clutch operated by a shoulder-high control rod running the length of the bed controls the power.

Instead of the usual eight, the new 20-in. lathe has 16 spindle speeds. This large speed range was considered necessary because a lathe of this type is often used in tool rooms to swing large jig work in which both small and large holes are to be bored. This also applies to turning and facing, in which latter operation the cut-

ting diameter will vary all the way from 0 to 20-in., and to maintain a fairly constant cutting speed a larger range of speeds is necessary.

This machine is available in three lengths of bed, with

48, 72 and 96-in. center distance respectively. The net weight of the 48-in. center distance machine with regular equipment is approximately 6200 lb. without motor and electrical equipment.

Better Oil Recovery Methods Will Increase Fuel Supply 60 to 80 Per Cent

WITHOUT attempting to answer the question whether the oil industry can continue to furnish the vast quantities of gasoline that will be needed for the motor vehicles now in use and those which will be added in the future, H. H. Hill, chief petroleum engineer, Bureau of Mines, read a paper before a recent meeting of the Engineers Club of Philadelphia in which he called attention to the following factors as being of considerable importance in supplying our future fuel:

Additional improvements in methods of locating oil deposits.

More extended application of artificial methods of recovery.

Increased use of cracking processes.

Increased efficiency in utilization.

Improvements in drilling methods permitting deeper drilling.

Improvements in pumping methods to permit higher lifts.

More efficient use of gas for recovery of oil from sands.

Increased efficiency in distillation equipment.

Importation of foreign oils.

Development of substitute fuels.

The first four items he considers to be of greatest importance, although the others will probably have some effect on future fuel supplies. New oil fields will need to be discovered to take care of increasing demands, so that any improvement in methods of locating them will be very valuable.

Artificial methods of recovery, such as the use of compressed air or gas, water-flooding, or some method not yet in use, will doubtless have an important bearing on the future supply, he stated. Estimates vary as to the amount of oil that is left in the sand under present methods of flowing and pumping, but the figures most often used are from 60 to 80 per cent.

Billions of Barrels are Left

Since oil production to date has been more than 8,000,000,000 barrels, the amount remaining in these fields already drilled would be between 12 and 32 billion barrels. The recovery of part of this oil, at least, Mr. Hill thought, was probably the most important problem before the oil industry.

The introduction of compressed air and gas has been successful in limited areas, he said, and water flooding has been successfully employed in at least one area. Since there are now over 300,000 producing oil wells in this country, besides several thousand which have been abandoned, it is easily realized that even a small increase in the production per well would add large quantities to our daily output.

About 26 per cent of the refinery output of gasoline for 1925 was made by cracking heavier oils. This figure could be greatly increased since there are processes now in use that will convert almost all grades of heavy oil

into gasoline. There is probably no one factor, Mr. Hill said, that is more important with regard to a future supply of motor fuel than a more extended use of the cracking process in the refineries of the country.

The production of gas oil and fuel oil for 1925 was about 15,300,000,000 gal., or about 49 per cent of the

TABLE 1
DATA ON REFINERY PRODUCTION OF GASOLINE, REGISTRATION OF CARS AND TRUCKS AND GASOLINE PRICES FOR THE 10-YEAR PERIOD, 1916 TO 1925, INCLUSIVE

Year.	Yield of gasoline. Per cent.	Indicated domestic demand for gasoline. Gallons.	Registration of car and trucks.	Gallons of gasoline per car, based on mean number of cars registered at beginning and end of year.	Average tank wagon (wholesale) price of gasoline, New York City. Cts. per gallon.
1916	19.8	.....	3,512,996	.....	23.0
1917	21.6	2,363,230,401	4,983,340	556	23.8
1918	26.1	3,129,266,347	6,146,617	562	24.2
1919	26.1	3,434,812,486	7,565,446	501	24.5
1920	26.8	4,250,696,163	9,231,941	506	29.3
1921	27.7	4,516,027,256	10,463,295	459	26.1
1922	29.5	5,372,085,042	12,238,375	473	25.1
1923	30.9	6,685,035,280	15,092,177	489	20.7
1924	33.1	7,783,498,908	17,591,981	476	18.0
1925	35.0*	9,362,094,000*	20,100,000*	497*	19.1

*Preliminary figures subject to revision.

crude oil charged to the stills. Although some part of this is used for gas making and a certain percentage is used as fuel for purposes for which coal could not be used satisfactorily, most of it is used in direct competition with coal and if necessary could be replaced by that fuel. This gas and fuel oil could be used for producing gasoline, said Mr. Hill, by cracking, and if this were done the output of gasoline might be doubled without using all the material available.

More efficient utilization of gasoline is possible, Mr. Hill believes, because automotive engineers have frequently stated that it is possible to double the efficiency of the present automobile engine, thus doubling the miles per gallon of fuel. The saving of fuel which such a development would bring about is obvious. Mr. Hill thought that probably a new fuel which would stand high compression would be developed for this purpose but he said that a number of refineries are now working on this problem so that it is quite possible that a suitable fuel will be available by the time the new type engine is in general use. In connection with his talk Mr. Hill presented the figures contained in Table 1.

New Vertical Six British Airplane Engine Extremely Powerful for Weight

Water-cooled "Nimbus," rated at 340 hp., weighs only 665 lb.
Is redesign of Siddeley "Puma." Three valves per
cylinder. Maximum output at 1600 r.p.m.

A NEW water-cooled aircraft engine, the "Nimbus," rated at 340 hp., has been added to the line of the A. D. C. Aircraft, Ltd., of England. This company, which held the whole stock of the Siddeley "Puma" engines from the war period, has developed this engine to take the place of the Puma, which, although a reliable medium-power engine, has now become considerably out of date, its position being analogous to that of the Liberty in certain respects in this country, being designed in an even earlier period of the war than the Liberty.

In the design of this new engine, the general lines of the Siddeley Puma have been followed, Major Halford, who is the original designer of the Puma, having also designed the Nimbus. Externally, the new engine differs but slightly from the Puma; in fact as stated by our British contemporary *The Aeroplane* it is entirely interchangeable with the Puma, although most of the essential parts have been redesigned.

By increasing the bore 5 mm. and changing the manifold, valve design, etc., the power of the engine has been raised from 230 hp. for the Pumas to 300-340 hp. for the Nimbus. On the other hand, the new engine weighs 30 lb. less than the Puma, the specific weight of the new engine being under 2 lb. per hp. as against nearly 2.5 lb. per hp. for the Pumas, thus putting the new engine in a class by itself as being probably the lightest aero engine per hp. of the six-cylinder vertical type in the market.

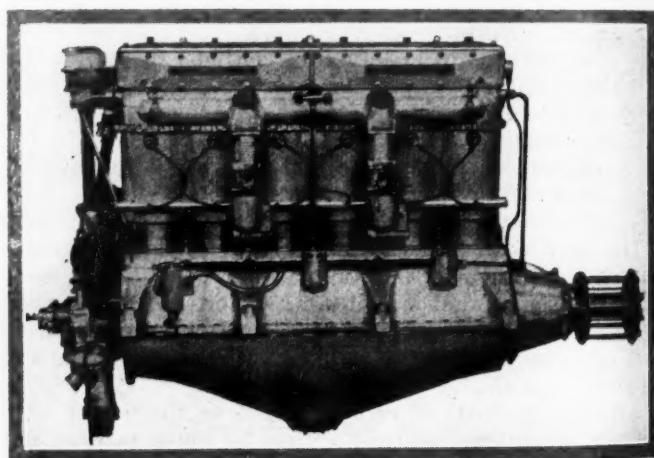
Although the cylinder arrangement of the Puma has been followed in general in the new engine, the design features differ considerably. Steel cylinder barrels with closed heads, assembled in series of three enclosed in a common water jacket composed of aluminum alloy castings, with each of the two blocks finished with an individual cylinder head block, also of a light alloy, are a feature of the new engine. The water jacket castings, into the base of which are screwed the cylinder barrels, are fastened by studs and nuts to the cylinder heads, the valve seats themselves attaching the head directly to the cylinder barrel as well, as these seats screw directly into the head castings and are provided with castellations for a special screwing-in tool.

An unusual feature of design of the new engine is the fact that three valves are used per cylinder. The exhaust valves are of normal size whereas the single inlet valve is of a very large diameter.

Engine accessories, which include two magnetos firing separate sets of spark plugs in each cylinder, a centrifugal water pump, and a gear-driven oil pump, are all mounted at the rear of the engine. The overhead camshaft drive is also at the rear of the engine and outside the main crankcase and cylinder castings where it is easily accessible. Due to the fact that the crankshaft is

not centered over the cylinders, but is mounted so that the exhaust valves are operated directly from the shaft, the inlet valves being actuated by rocker arms, the camshaft drive is slightly inclined.

The increase in performance which has been possible in planes fitted with the Siddeley Puma when equipped with the new Nimbus has been demonstrated by actual tests with a D. H. 9. Comparative figures with the plane carrying exactly the same loads with the two engines have been obtained and show that the speed of the plane



Inlet side of "Nimbus" engine

was increased by the adoption of this engine from 115 miles per hour to 135 miles per hour at sea level while the climb to 10,000 feet was reduced from 18.8 minutes with the Puma to 12 minutes with the Nimbus. At the same time the service ceiling of the plane through the fitting of the Nimbus was increased 4500 feet, or to 19,500 feet.

Following are the major specifications:

340 hp. A. D. C. Nimbus Engine

Bore	152 mm.
Stroke	190 mm.
Compression ratio	5.4
Normal output	305 b. hp. at 1450 r.p.m.
Maximum output	335 b. hp. at 1600 r.p.m.
Fuel consumption	0.52 pints hp. hr.
Oil consumption	.015 pints hp. hr.
Weight, dry	665 lb.

It is to be noted that the maximum output of this engine, 335 b. hp., is obtained at 1600 r.p.m., which is a rather low speed as compared with modern practice in the United States.

Power Feed of Spindle is Incorporated in Vertical Maximiller

Vertical adjustment also provided on latest addition to line of similar machines manufactured by Kempsmith.

VERTICAL adjustment and power feed of the spindle are innovations in milling machine construction which are incorporated in the new type Vertical Maximiller which is manufactured by the Kempsmith Manufacturing Co. of Milwaukee. With the exception of the new spindle head construction, these machines are interchangeable with Nos. 2 and 4 vertical machines which the company has had in production for some time.

Primarily the new type machine is intended to facilitate such operations as die sinking, jig boring and many tool making jobs, and application to a variety of production jobs is being made. Heretofore, feed in the vertical direction by either hand or power has been obtained by actuating the heavy table assembly by means of the usual jack screw. The manufacturer of this new machine states that its ability to accomplish vertical feeds without the necessity of moving the heavy table assembly produces smoother finish and provides a better range of speeds which make for greater flexibility of operation.

From the drive pulley through to the upper horizontal shaft and the face of the frame of the machine, the new construction is identical with previous types. A new type head which is bolted on a scraped joint incorporates the spindle quill with its heavy spiral bevel drive gears and the mechanism for producing both hand and power feed in both directions. An octagonal cast-iron quill which is scraped into bearing in the head carries the live spindle in the usual adjustable taper bearings. A ball thrust bearing supports the thrust load of the driven spiral bevel gear and rotation is transmitted to the live spindle through slip splines.

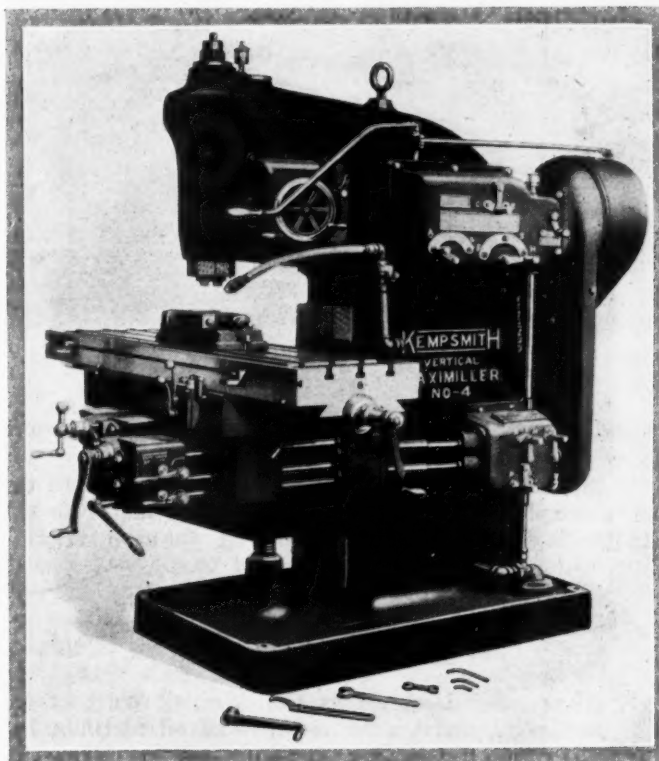
Worm and Wheel Power Feed

Power feed at the rate of .005, .009 or .014 in. per rev. is set by a small lever on the spindle housing. This feed is obtained through a worm and wheel combination which drives a screw and a safety device prevents over-travel. Hand feed is obtained through a compounded hand wheel at the rates of .025 in. or $\frac{1}{8}$ in. per rev. A knob at the center of the large hand wheel controls the higher rate of hand feed. These feeds are available for moving the spindle either downward or upward. Maximum spindle travel for either type of feed is 6 in.

For special purposes the spindle quill can be fitted with a ball bearing high speed spindle. Like their predecessors of the standard vertical type, these machines have 18 spindle speeds which are tabulated herewith.

	No. 2	No. 4
Standard plain bearing spindle	16-400 r.p.m.	14-355 r.p.m.
High speed ball bearing spindle	40-1000	35-887

Gears and shafts throughout these machines follow automotive practice. Heat treated alloys and ball bearings are used generously. In fact the live vertical spindle is the only high duty shaft which is not carried in anti-friction bearings. Tables are equipped with a variety



Kempsmith Vertical Maximiller. Adjustable spindle consists of octagonal quill carrying live spindle. The octagonal construction eliminates gibs and permits adjustment for wear

of working speeds and a manually controlled power rapid traverse of 100 in. per min.

Like previous vertical Maximillers, spindle noses are equipped with key slots for driving the cutters which are held in place on a ground taper seat and are drawn up by means of a nut resembling a turn buckle. Right and left hand threads are used at the opposite ends of this nut so that a heavy cutter can be placed upon the table and brought up to the spindle nose. As the two approach each other, rotation of the nut draws the cutter into place in correct alignment.

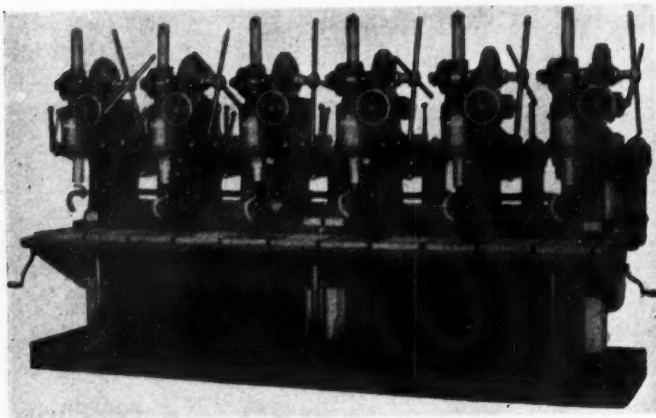
MAKING use of the Paris Opera House, Andre Citroen recently presented for the first time his movie film "La Croisiere Noiere," depicting the Haardt-Audouin Dubreuil automobile expedition across Africa from Algiers to the Cape and back to Madagascar. Eighteen miles of film were taken on this expedition, during which eight automobiles crossed the Sahara, penetrated into the heart of Africa, and then worked their way down to the Cape and to the Indian Ocean.

What's New?

Machine

Gang Drill for Production Work

THE W. F. & John Barnes Co., Rockford, Ill., has recently put out a 20-in. production gang drill of new design. The construction of the machine, as appears from the illustration herewith, is such as to afford space



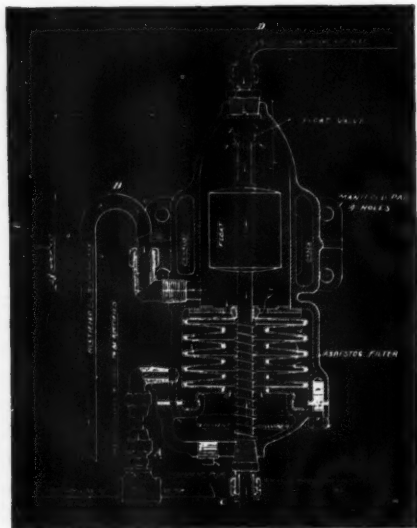
W. F. & John Barnes gang drill

economy, as it permits of a close and convenient grouping of the machines.

By the use of Morse silent chain drives built into the tool, a simple and positive drive from the motor to the spindles is obtained, a high-powered Johnson friction clutch being used for each spindle.

Wall Oil Rectifier

AN oil rectifier designed by Col. Wm. G. Wall, of Indianapolis, and known as the Wall oil rectifier, has been placed in production by the Rectifier Mfg. Co., Chicago, Ill. The device, of which a sectional view is shown herewith, is designed not only to filter any dirt and sediment out of the oil, but also, by a distilling operation, to remove the water and reduce the dilution to a very low figure. The only change in the design of the



Section of Wall oil rectifier

engine required for the installation of the rectifier consists in providing a pad on the exhaust manifold, which latter is so arranged that a portion of the exhaust gas is deflected into and around the exhaust gas jacket of the rectifier.

Referring to the illustration, A is a fitting connecting to the oil pressure line of the engine, which is made of such size that it limits the flow of oil to the rectifier to about one quart every five minutes. The rectifier is divided into two parts, the lower acting as a filtering chamber, the upper as a distilling chamber. The filtering chamber is provided with a large asbestos sack in bellows form, giving a large filtering area in a very compact space. Through this filtering material the oil must pass, and in consequence all dirt and sediment is removed before it reaches the upper chamber. The filtering medium is asbestos, and the rectifier is so designed that the filtering sack is easily removed for cleaning and inspection.

The distilling chamber is exhaust-jacketed, and the application of heat to the oil distills off any water and low boiling point fuels, the vapors thus formed being taken into the carburetor air inlet through the line D. It is stated that this does not affect the carburetor adjustment.

Connection D maintains a partial vacuum in the distilling chamber, assisting the distilling operation and holding the oil in the chamber until a sufficient amount has entered to lift the float valve from its seat. This breaks the vacuum and allows the filtered and rectified oil to syphon back into the crankcase, through line B.

As the oil level in the distilling chamber falls, the float valve closes again and the operation is repeated as long as the engine is running. The vacuum relief line C is connected to the upper part of the crankcase and draws off any gasoline vapors that may accumulate there. The oil is by-passed through the rectifier, and it is claimed that even if the device should fail to function, due to neglect to clean the filtering sack, the lubrication of the engine will not be affected.

Tests made with the system are said to have shown that, starting with dirty, diluted oil containing as much as 19 per cent diluent, all of the dirt was filtered out in a short time and the diluent reduced to 4.5 per cent. The viscosity of the oil is raised to almost that of new oil and the oil is kept entirely free from water.

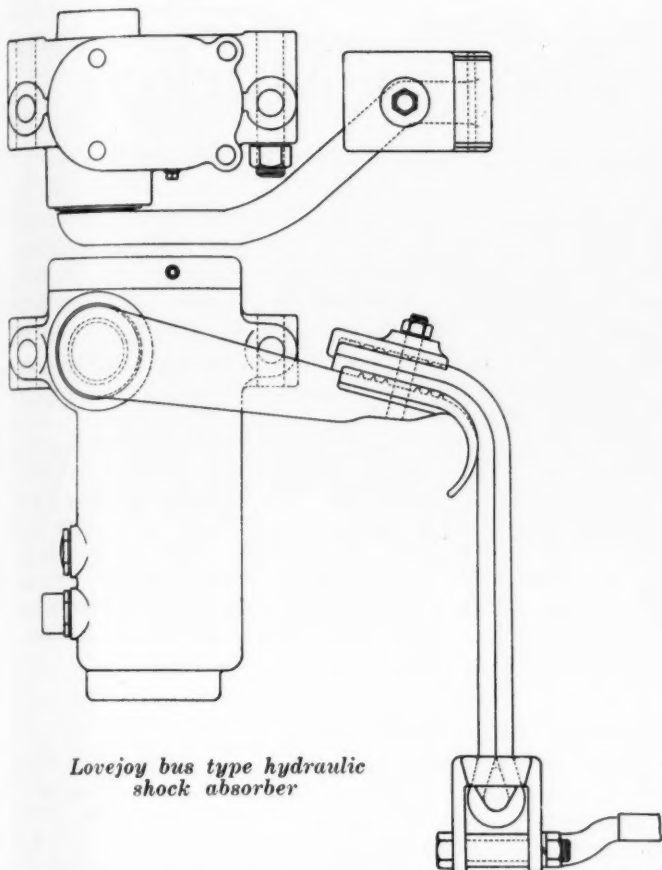
When a rectifier of this type is used the oil need be removed from the crankcase only at long intervals, which results in economy on the cost of oil, reduces the need for repairs and adds to the life of the engine.

Lovejoy Bus Shock Absorber

AFTER having manufactured for a number of years an hydraulic type of shock absorber for passenger cars, the Lovejoy Mfg. Co. of Boston, Mass., has brought out a shock absorber on similar lines designed for buses. The principle is the same as that of a door check, the kinetic energy of the bus body being absorbed on an oil cushion.

These bus type shock absorbers are made in both horizontal and vertical types. Both operate on the same principle, but in some cases it is inconvenient to install the vertical type. Universal lugs are provided, so that

Tools, Accessories and Parts



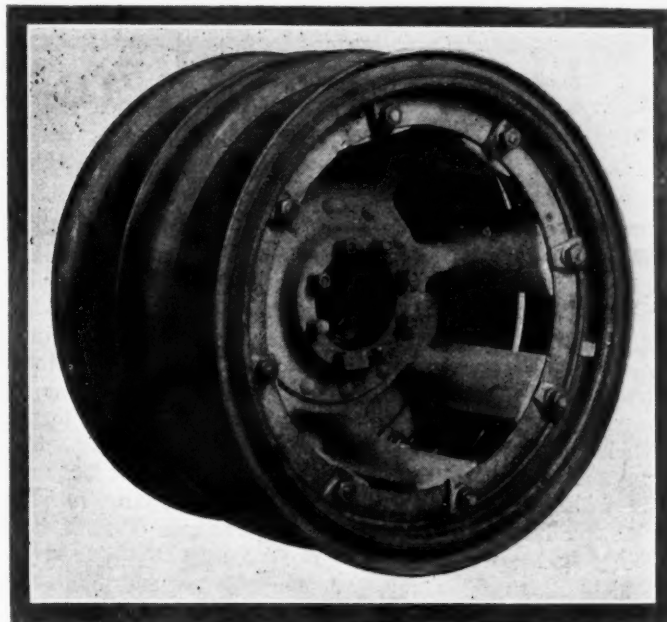
Lovejoy bus type hydraulic shock absorber

horizontal and vertical fastenings may be used. Methods of installation on Yellow Coach, Mack, Pierce-Arrow, Fageol, White and other prominent makes of bus have been worked out.

The resisting medium in these shock absorbers is oil, and all of the mechanism is said to be so thoroughly enclosed that no oil can get out and no dirt can get in. This also eliminates the need for periodic adjustment and for lubrication. The device is said to compensate automatically for variations in load.

New Van Dual Wheel

THE Van dual wheel, recently announced by the Van Wheel Corp., Oneida, N. Y., is a departure from other types in that it carries standard Firestone or Goodyear rims, and standard wood wheel hubs. Both rims are mounted on the old style steel felloe bands formerly used for shrinking over wood felloes. The rear band is permanently riveted in place and the rim mounts on it and is bolted up the same as any single tire wheel. The front rim is mounted on a loose felloe band, split to provide proper gripping action, and this band drops over the front of the wheel and is held in place by the same bolts and clamps which keep the rim in place. To take off the rear tire, the eight nuts and clamps in front and the clamping ring are removed. The front rim and front steel felloe band then slide off and the rear rim is removed the same as if it were on a single wheel. The rim bolt nuts for the rear rim can be tightened up while the front rim is in place.

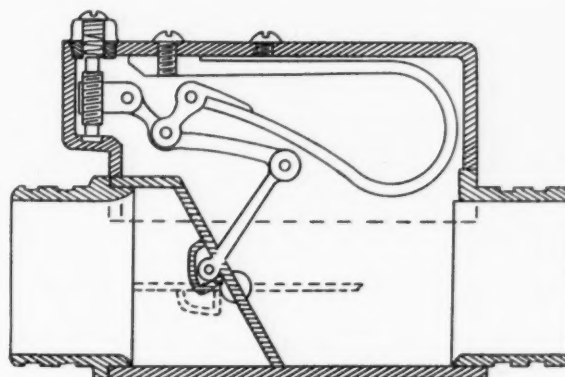


The new Van Dual Wheel

Dole Red Dagger Thermostat

A THERMOSTATIC valve for automobile cooling systems based on the properties of dissimilar metals has been placed on the market by the Dole Valve Co., 1923 Carroll Ave., Chicago. A section of the valve is shown herewith. It is inserted in the water connection from the engine to the top of the radiator, in such a way that the hot water rising from the engine jacket will enter the housing of the thermostatic metal. The thermostatic metal is bent into loop form and connects to a butterfly valve in the water passage. Whenever the temperature is near atmospheric the valve is closed, so there can be no circulation through the radiator.

As hot water enters the chamber in which the thermostatic metal is located the loop tends to straighten out and the valve is opened in consequence. It is claimed for the Dole thermostat that it permits the engine temperature to rise to 160 deg. F. in three minutes in all kinds of weather, and that it maintains the temperature at this point under all conditions.



Section of Dole Red Dagger thermostat



Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

French Airplane Firm Busy

THE Breguet airplane factory at Villacoublay, in the Department of Seine-et-Oise, near Paris, France, is now producing planes at the average of three per working day and is said to have sufficient orders to keep it working at that capacity until February, 1927. With a total annual production of 900 planes at present, the Breguet Company exports about one-third and sells the rest to the French Government and French air lines, it is reported. It manufactures only planes, installing Renault or Lorraine-Dietrich engines. The Breguet Company is said to be the largest producer of airplanes in France and possibly in the world.

American Cars in England

THE most popular American cars in the United Kingdom, the Automotive Division of the Commerce Department is informed, are the closed types which sell in the United States for between \$750 and \$1,600. Sales of American cars in the less than \$700 class have been slow, it is reported, and new models of these types are seen only at rare intervals. Low-priced American truck movement in the United Kingdom continues good. "Salesmen report encouraging prospects for increased sales with the advent of the new licensing period," continues a consular report to the Division, "and the beginning of the 1926 motoring season. It is forecast that 1926 will offer an even better market than 1925, which has in some respects been a record year."

Light Trucks on Free List

GUATEMALA, by virtue of an executive decree, has placed motor trucks from one to two tons capacity and all kinds of tractors upon the duty-free list for a period of six months.

Austrian Sales Impeded

THE sale of American cars in Austria has been seriously handicapped by the valuation system in effect for American cars. Although less marked than in former years, the fourth quarter was characterized by the usual seasonal decline of sales. Citroen sales have been facilitated by deferred payment plan which involves only a small increase in the sale price. Austria continues to be a fair market for foreign made light trucks; on the other hand, however, the possibilities for the importation of heavy trucks and buses are small, owing to strong local competition and low prices. A firm has recently been established for the financing of car and truck sales and this should stimulate sales of American cars. American motorcycles, on account of their reputation for sturdiness and reliability, are steadily gaining ground, especially in the provinces of Austria.

French Buying Accessories

A DEVELOPMENT to be especially noted in the French automobile market is the growing interest in automobile accessories. A short time ago French cars car-

ried practically no accessories beyond a speedometer and a clock. Now nearly all the garages and supply shops are showing various appliances, such as spot lights, automatic wind-shield cleaners, shock absorbers and bumpers. Many well-known American makes are represented among these articles.

New German Motor Fuel

A NEW anti-knock motor fuel has been put on the market by the Hugo Stinnes Oil Aktiengesellschaft of Berlin. It is claimed that the research leading up to this new preparation has been made by the German Dye-Trust, the I. G. Farbenindustrie at Ludwigshafen on the Rhine. The research has lasted for a number of years and it is believed in Germany that the preparation, brought out under the name of "Metalin," is now completely tested and ready for practical use.

Foreign Companies to Merge

THE Automotive Division of the Department of Commerce is advised that negotiations are in progress in Czechoslovakia for a merger of the Cesko-Moravska Kolben Company, manufacturers of the "Praga" car, and J. Walter & Company, builders of the "Walter" automobile and motorcycle. The consolidation is to be effected by an issue of stock of the former company for the latter corporation. The manufacturers of the "Praga" also are engaged in the building of locomotives, steam engines, electrical equipment and structural iron.

New Tire Factory for England

A WELL-KNOWN French tire company has recently commenced the construction of a factory in Stoke-on-Trent, England, at an estimated cost of £500,000, which, when completed, will provide work for between 8000 and 10,000 people. It is expected to have the first section of the factory equipped for production within a year. The remainder of the program will then be developed until the project is complete within a period of five years.

Road Congress in Italy

THE Fifth International Road Congress will be held in Milan, Italy, in September, 1926. A road exhibition will take place concurrently with the Congress. The road exhibition will probably afford an opportunity for American firms with representatives in Europe to exhibit their products.

Concrete Roads in England

IN Great Britain 120 miles of concrete road were built in 1925, establishing a record, and bringing the total mileage of concrete roads to 250. The use of cement in road construction is attracting much attention in spite of the higher original cost. Many new bridges are of concrete.

EDITORIAL

Conservative Terms Approved

THE N.A.D.A. financing resolution which urged one-third down and twelve months to pay as maximum instalment terms has met with more universal approval than any other single point in the dealers' recommendations. Even factory executives who were dismayed at the strong indorsement of non-recourse financing in those resolutions, have expressed themselves as heartily glad that the resolutions were passed because of the good they believe will come from the endorsement of conservative instalment terms. That minority of factory executives which was in accord with the dealers' indorsement of non-recourse also was pleased with the resolution on down payments and time extensions.

Some factory men still believe that 18-months paper is thoroughly sound and propound quite convincing arguments to that effect. Their argument reduced to basic terms, rests pretty much on the necessity for complete and adequate credit investigation before the granting of risks. This often is lacking, both in recourse and non-recourse deals. It shouldn't be lacking, of course, but the fact remains that in many cases it is.

Experience figures prove that *under present average methods of operation* losses are considerably higher on 18-months paper than on 12-months paper. Eighteen-months paper could be made equally safe only by insuring more careful credit investigations in such cases than when notes are to run only for 12 months—and to achieve this end in the average case undoubtedly presents difficulties.

Retail financing still presents a number of unfavorable aspects from the standpoint of conservatism and clarity in presentation of actual costs, but improvement has taken place without much doubt in the last few months.

Some of the plans which were most liberal in permitting low down-payments and in extending long time to pay have been discontinued, although repossession resulting from their use have not all been recorded yet. It is generally agreed, however, that a trend toward more sound methods is under way.

Reclaimed Rubber in Tires

CONSIDERABLE difference of opinion seems to exist among rubber men as to the economic possibilities of using reclaimed rubber in tire manufacture.

A series of tests with tire treads compounded with different proportions of reclaimed rubber was undertaken by the Bureau of Standards but the results were rather discouraging. To state them in a few words, it was found, substantially, that if two tires are made up with the same amount of new rubber,

which in one case is used alone while in the other there is added a percentage of reclaimed rubber ranging up to 25 per cent, the life of the two tires is the same. The addition of the reclaim does not add to the life at all.

Rather strong exceptions were taken to these findings at the recent Akron meeting of the Division of Rubber Chemistry of the American Chemical Society, at which a paper was presented by two chemists connected with a Boston rubber company, in which the claim was set forth that up to 10 or 15 per cent of reclaimed rubber can be added to new rubber without reducing the qualities of the stock in any way.

The scientists of the Bureau of Standards stated their results and did not draw any sweeping conclusions therefrom. It may be, of course, that the reclaimed rubber they used was not the best to be had. Besides, reclaiming processes probably have not yet reached the limit of their development, and if a large new field like that of tire manufacture should become opened to the product, we might expect a considerable amount of research effort devoted to their improvement.

Weight Distribution

SEVERAL years ago, in connection with certain proposed legislation relating to weight limits on commercial vehicles, it came to light that in some of our modern trucks, when they are uniformly loaded to capacity over the whole length of their platform, the proportion of load on the front axle is less than 10 per cent. This, of course, is due to the large overhang of the body over the rear axle, which is provided for in the design because it is desired to make the largest percentage of the total weight available for traction purposes and incidentally to make the steering easy.

This unequal distribution of the load between the front and rear axles is not, however, without its disadvantages. It is quite obvious that if the front wheels press very lightly on the ground, they cannot have very much steering effect, and under certain conditions of slippery roads the steering may fail entirely.

The safety of the vehicle is also reduced if the weight is thus unequally distributed, and this was strikingly shown in Berlin about a year ago when a motor bus of the old "high-perched" type was run into by a private passenger car at the front end and deflected from its course to such an extent that it turned over. This lesson on the unsuitability of that type of bus went home so well that the Berlin Omnibus Co. immediately canceled all contracts for new omnibuses then outstanding, and decided to put into service from then on only buses of the safety type.

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Thursday, April 1, 1926

Season Brings Car Sales in Range With Production

The lull between the preparation of spring automobile stocks and the actual opening of the spring merchandising period gives every indication of having ended. From this time on car movement at retail should at least equal factory production, with the prospect that within the next few weeks sales will run considerably in excess of factory shipments.

With the start of this heavy retail delivery movement factory production will increase slightly, but as output has been at high levels in the early months, the production step-up will not be as spectacular as in former years. In a number of instances capacity production has obtained for the past several months, and for the industry as a whole, the production rate in the early months has been only slightly below this rate. The evenness of this manufacturing will make for profitable operation.

Records of retail deliveries in several sections of the country show them to be in excess of former years, and several car companies show retail sales to be in excess of the manufacturing rate. On the whole the situation cannot be regarded as anything but favorable, particularly with the big used car season now opening. Used car movement is an important determining factor in the sale of new cars in the industrial districts and it is from these districts that the principal business of the second quarter is derived.

Sales of cars and other automotive products in foreign territories promise to reach new proportions with the development of better financing and credit facilities. Special effort has been made by all leading American producers to place foreign credits and financing facilities on somewhat the same plane maintaining in the American retail field and this effort has now reached a point where its influence will be distinctly manifested.

Fonck Engaged to Try New York-Paris Flight

NEW YORK, March 31—Capt. Rene Fonck, French ace, has been engaged by the Argonauts, Inc., to attempt a non-stop flight from New York to Paris between June 20 and July 1 for the \$25,000 standing prize offered by Raymond Orteig, proprietor of Hotels Brevoort and Lafayette, for the first successful flight between these points.

The plane is being built by the Sikorsky Aero Engineering Corp. at Roosevelt Field, L. I. It is a cabin biplane with large upper and small under wing and with three 425-hp. air-cooled Gnome-Rhone Jupiter engines.

March Production Climbs to 447,185

NEW YORK, April 1—Preliminary figures on March production as reported to the directors of the National Automobile Chamber of Commerce at their meeting today show an estimated total of 447,185 passenger cars and trucks for United States and Canadian factories.

The total is the second highest for any month in the industry's history, being exceeded only by the record total of 452,486 in October, 1925. March shipments are 71,853 over February this year and 75,234 over March, 1925. The total is 18 per cent ahead of the March production average for the past three years.

Production Higher as Tire Sales Gain

AKRON, March 29—Automobile tire manufacturers are gradually increasing production as orders from distributors and dealers gain in volume. There is still a large surplus of tires stored in factory and branch warehouses, however, and the industry probably will proceed cautiously for the next few weeks.

Retail tire business has been seriously retarded by the cold weather, and the uncertainty existing in the trade as to the future trend of prices. Many authorities are looking for another reduction sometime in April.

The major rubber factories, including Goodyear, Goodrich, Firestone and Miller, are preparing to operate on full six day a week schedules. For the past two months these plants have been in operation five days a week, with reduced forces.

General Tire & Rubber Co. is now operating four days a week, compared with three day a week schedules in effect during February and early March. Several smaller plants also have increased tire production about 20 per cent.

Practically all rubber companies have suffered huge inventory losses on crude rubber, which was purchased at higher levels late last year. Another tire price reduction at this time would mean considerably larger losses.

PAIGE PRESENTS \$1295 BROUGHAM

DETROIT, March 30—A new chassis, 10 in. shorter than the standard Paige model introduced recently, has been added to the line to accommodate a new body style known as a brougham and listed at \$1295, it is announced today by the Paige-Detroit Motor Car Co.

This model, which carries the full line of equipment as that employed on the larger car, including hydraulic four-wheel brakes and 31 x 5 1/4 in. balloon tires, is the lowest priced Paige car ever offered. The chassis units, including the engine, are the same as used in the new Paiges on 125 in. wheelbase chassis, while the body is of new design having two extra wide doors and finished in two tones of lacquer—Arizona gray and Pueblo gray—with ivory striping.

Car-Foundry Centers Offices in New York

NEW YORK, March 31—About May 1 general sales headquarters of Fageol Motors Co. will be moved from Detroit to 30 Church street, New York City, and the offices of American Car & Foundry Motors Co. will also be moved to the Church street address.

The Fageol factory at Kent, Ohio, will be retained. It is now being used for production and later will be used for special jobs, engines and alterations. The Hall-Scott Motor Car Co. factory will remain at Berkeley, Calif., for the time being.

W. L. Stancliffe, now in Detroit as general sales manager for American Car & Foundry Motors, will be in charge of the New York marketing headquarters. Carl Abell, from the Oakland, Calif., Fageol offices, is already here as advertising and promotion manager. F. R. Fageol is vice-president of American Car & Foundry in charge of sales policy.

Chrysler Sales Make New Weekly Record

NEW YORK, March 31—Chrysler deliveries last week exceeded the record week of April 18, 1925, and were 35 per cent higher than those of the corresponding week last year. Retail deliveries each week this year have exceeded those for the same weeks last year, and the year to date is 31 per cent above this period in 1925. Used car stocks in dealers' hands are said to be less than last fall, with dealer orders for new cars for April and May shipment one-third larger than the same months last year.

No Action Likely on Motor Bus Bill

Senate Committee Hearings Expected to Result in Withholding Report for Session

WASHINGTON, April 1—Hearings on the Cummins motor bus bill were concluded before the Senate Interstate Commerce Committee this week. Notice was given to the scores of interested motor bus and truck representatives who attended the sessions by Chairman James E. Watson of Indiana that a meeting of the committee will be called within a few days to decide whether they approve of restrictive motor transportation legislation at the present and if so, what form it should assume.

Thomas H. MacDonald, chief of the Bureau of Public Roads and Frank M. Hunter, formerly chief counsel of the Pennsylvania Public Utilities Commission, were the two witnesses heard at the final hearing on Tuesday. At the conclusion of this hearing Judge Alfred Thom, general counsel of the American Association of Railway Executives gave notice that he had desired to be heard and Senator Watson promised him if the committee decided they should sponsor restrictive motor transportation legislation that arrangements would be made for him to give testimony. Mr. Thom said he wished to discuss the constitutionality of the proposed Cummins bill.

Those close to the members of the committee appear convinced that decision will be reached not to report out the Cummins or any other bill along its lines at the present session of Congress. The view is that eventual regulation is certain but action at the present early date unwise. The hearings held have brought out a quantity of valuable information on the motor transportation problem which has proven educational and doubtlessly put members of Congress in a position where they can deal intelligently with the subject at a later date.

Lucius S. Storrs, managing director of the American Electric Railways Association told the committee legislation should be forthcoming that would place buses and all other common carriers on an equal competitive basis under the same Federal regulation. Thirty-nine states now have passenger carrier motor vehicles in operation, he said.

International Builds Light Delivery Truck

SPRINGFIELD, OHIO, March 29—Karl O. Schreiber, superintendent of the Springfield works of the International Harvester Co., announces that a new light delivery truck is now in production at the local works. This new unit called "International Special Delivery." The engine is of the L-head type, has four cylinders, 3½ in. bore, and 4½ in.

stroke. Lubrication is full force feed throughout the engine, Alemite on the chassis. Prices range from \$765 to \$895.

The emergency brake is external, located on the propeller shaft immediately back of the transmission. Service brakes are on the rear wheels, power being supplied through an equalizer. International rear springs are standard equipment.

Machine Tool Show Set for Sept. 7-10

NEW HAVEN, CONN., April 1—Announcement is made this week of the Sixth Annual New Haven Machine Tool Exhibition, to be held here Sept. 7-10, inclusive. This exhibition is conducted jointly by the New Haven Section, A. S. M. E.; the Mechanical Engineering Department, Sheffield Scientific School, Yale University, and the New Haven Chamber of Commerce. Last year the exhibition attracted 18,000 visitors from all parts of the United States and many foreign countries. More than 100 machine tool builders exhibited their products. Technical sessions are held in connection with the event. This year Thursday, Sept. 9, has been set aside as Executive's Day for the particular benefit of factory executives, and admission on that date will be by special ticket only.

Schrader to Build Akron Valve Plant

AKRON, March 30—A. Schrader's Sons Co. has awarded a contract to the Turner Construction Co., of Buffalo, for erection of a new assembling plant in Akron, to cost approximately \$300,000. It will have an estimated capacity of 150,000 tire valves or more a day.

The building will be five stories high, on a foundation 52 x 200 feet, and will provide about 65,000 square feet of floor space. It will be adjacent to the company's present warehouse.

Report Morris Motors to Build in Canada

NEW YORK, March 27—Reports from Toronto say that Morris Motors, Ltd., of Great Britain, is planning to construct a Canadian branch for its Canadian and Australian business, following consolidation of its English plants.

This concern will soon make public offering of £3,000,000 of 7 per cent preferred shares and 1,000,000 £1 common shares. Net profits last year were about \$6,660,000 or about \$1.25 per car.

Fisk on Two Shifts

NEW YORK, March 27—The Chicopee Falls plant of the Fisk Rubber Co., employing about 3,500 workers, is now operating on two shifts, the day force 45 hours a week and the night force 50 hours. The company is producing some 16,000 casings and 26,000 inner tubes daily at this plant in addition to 12,000 casings and 20,000 tubes daily at the Cudahy, Wis., plant.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

THE CREDIT SITUATION

NEW YORK, April 1—Interest continues to center in the stock market, where marked declines in quotations occurred throughout last week. On Monday of this week the downward movement was especially pronounced, and the day's transactions were the largest since March 3. Commodity prices also declined rather sharply last week. Trade in some lines is responding to seasonal stimuli, but forward purchasing is still almost entirely absent. Industry in general is somewhat more active than distribution.

COTTON

The final cotton-ginning report of the current season shows a total crop of 16,085,905 equivalent 500-pound bales, which is within 49,025 bales of the record total of 1914. It compares with a crop of 13,627,936 bales in 1924.

CAR LOADINGS

Car loadings in the week ended March 13 numbered 967,411, as compared with 964,681 in the preceding week and 926,119 in the corresponding period last year. Loadings for the year to date total 10,040,551 cars, as against 9,938,159 a year ago.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended March 24 were 9 per cent below the total for the preceding week but 11 per cent above that of a year ago.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 151.7 last week, as against 153.6 a week earlier and 154 three weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve Banks increased \$88,200,000 during the week ended March 24, with a gain of \$136,900,000 in discounts partially offset by declines of \$4,900,000 in open market purchases and \$44,400,000 in Government securities. Note circulation decreased \$200,000 and reserves \$14,900,000, while deposits rose \$49,000,000. The reserve ratio declined from 74.6 to 74.3 per cent.

Loans of reporting member banks increased \$30,000,000 during the week ended March 17, while investments rose \$193,000,000 and borrowings from Federal Reserve Banks declined \$31,000,000. Net demand deposits increased \$121,000,000, Government deposits \$179,000,000 and time deposits \$11,000,000.

MONEY

Both call and time loan rates were firmer last week, the former at 4½ to 5½ per cent as against 4¼ per cent a week earlier, and the latter at 4½ to 4¾ per cent as against 4¼ to 4½ per cent. Commercial paper rates were unchanged at 4¼ to 4½ per cent.

To Mix Ethyl Gas in Car Lots Only

Tentative Health Regulations
Require Ample Ventilation
to Make Handling Safe

WASHINGTON, April 1—Two sets of tentative regulations covering the production and distribution of tetra-ethyl gasoline have been sent out by the Public Health Service, the first of which covers the manufacture of the ethyl fluid and the second its blending with gasoline to make the motor fuel. The latter regulations provided that all ethylizing be done only at main distribution points and in not less than tank car lots. This latter provision is the principal change from the former method of manufacture and sale, when the ethylizing was done at filling stations for each individual sale.

Covering the manufacture of the ethyl fluid, special precautions are set up to protect the health of workmen. These provide for proper ventilation of plants, the examination of workmen before and during employment and notification of the hazards and precautions to be taken. The regulations also provide that all garages, repair shops, service stations and filling stations holding more than five cars be registered with the local health department; have permanently operative ventilating systems in addition to windows and doors, and should be kept clean by sweeping or flushing. The regulations for garages and stations are directed not so much against ethyl gas hazards as against the general danger of gas and dust-poisoning.

All filling stations are urged to post warnings that ethyl gasoline is to be used only as motor fuel and not for cleaning; to distribute leaflets describing the possible dangers, and to label all containers with similar warnings. A dye is to be added when manufactured as formerly to prevent individuals from using it for cleaning by mistake.

Chassis Tax Ruling

NEW YORK, March 29—A distinction with regard to application of 1926 taxes on bus or automobile chassis has been set up by the Revenue Department as follows:

Delivery of a chassis to a customer on which a special bus or passenger car body has been built after March 28 carries the new tax, though the order for the chassis was received prior to this date.

A buyer ordering a special type bus or passenger car body from a body manufacturer, which is to be built on a specified chassis, is taxable under the former scale if the body builder obtains possession of the chassis prior to March 28, though delivery of the completed vehicle is made after this date.

Bodies or chassis designed exclusively for hearses are not taxable under the 1926 act.

STRONG SEES YEAR AS RECORD MAKER

FLINT, March 27—E. T. Strong, general sales manager of Buick Motor Co., back from a recent tour which took him to every state in the Union, is convinced that 1926 will be a record year if present business indications can be taken as a criterion.

North, south, west and east, Mr. Strong said that he found every branch of industry and agriculture in a favorable condition. The usual condition of good prospects for one section and the reverse in others is entirely absent at present Mr. Strong said.

"I have returned from my trip with the firm conviction that 1926 is going to be a record-breaker for every one and that means that the automotive industry is going to break records," said Mr. Strong. "Buick dealers for the first time I can remember say that they have been unable to stock enough cars for the spring demand due to the flood of orders which have continued throughout the winter season."

Metal Gage Systems to be Standardized

NEW YORK, March 27—Elimination of confusion caused by 30 wire and sheet metal gage systems now in use in this country is to be brought about as the result of a conference held recently in the Engineering Societies Building.

The detailed technical work will be in the hands of a sectional committee, representing all interested industrial groups and working under the auspices of the American Engineering Standards Committee.

The conference favored the elimination of all gage numbers and the use of a simple system of designating sizes in decimals of an inch. Decision on the exact form of the solution was left to the sectional committee, the scope of whose work was outlined as follows:

"The standardization of a method of designating the diameter of metal and metal alloy wire, the thickness of metals and metal alloys in sheet, plate and strip form and wall thickness of tubing, piping and casing made of these materials, and the establishment of a standard series, or standard series, of nominal sizes and of tolerances for wires, sheets, plates and strips."

Sterling on Coast

LOS ANGELES, March 29—The Pacific Coast headquarters of Sterling Motor Truck Co. were recently established in Los Angeles under the personal direction of W. B. Hambly, vice-president of the company. With the early arrival of C. G. Hayssen, president of the company, in Los Angeles, negotiations will be completed for the erection of a large sales and service building.

Congestion Brings New Shopping Zones

Government Report Finds City
Traffic Leading to Decen-
tralization of Areas

WASHINGTON, April 1—The acute traffic congestion which the constantly increasing number of automobiles is causing in the retail districts of large cities is automatically bringing about a process which may help to alleviate the situation, according to a bulletin issued today by the Department of Commerce based upon the opinions of merchants who submitted their views on the subject.

This process is decentralization—the establishment of shops of various kinds outside the congested areas. The tendency of shoppers to do their buying away from traffic congested districts is being recognized by merchants.

These sub-centers in the largest cities now constitute complete shopping districts and differ from downtown shopping centers only in size and number of establishments. As parking facilities in these areas are usually ample, it is logical to assume, the merchants believe, that people who have cars will prefer to do their shopping there, free from anxiety and inconvenience, to say nothing of the saving of time.

The canvass of retail merchants by the Department of Commerce reveals that many attempts are being made to solve the parking problem in congested areas. Some merchants provide customers with parking space either in their own garages or some vacant lot. Other stores run buses to shuttle customers from parking districts to the congested center and back to their cars. One shop provides a chauffeur who will find parking space for customers and, if necessary, re-park the cars from time to time.

Pierce-Arrow Convenes Service Men on Coast

SAN FRANCISCO, March 29—More than 150 Pierce-Arrow service men from all parts of the Pacific coast, Nevada and Arizona, attended the three-day service convention of the Pierce-Arrow Motor Car Co. in San Francisco the middle of March. Myron E. Forbes, president of the corporation, made a special trip to the coast to attend this meeting, which was in charge of Fred J. Wells, service manager at the Pierce-Arrow factory. Axel Thellman and B. E. Torkelson, assistants to Wells, also were in attendance.

Dayton Cord Branch

LOS ANGELES, March 29—G. Walter Spahr, general sales manager of the Dayton Rubber Mfg. Co., completed arrangements during his recent visit here for the establishment of the Pacific Coast distributing headquarters for Dayton Cord Tires in Los Angeles.

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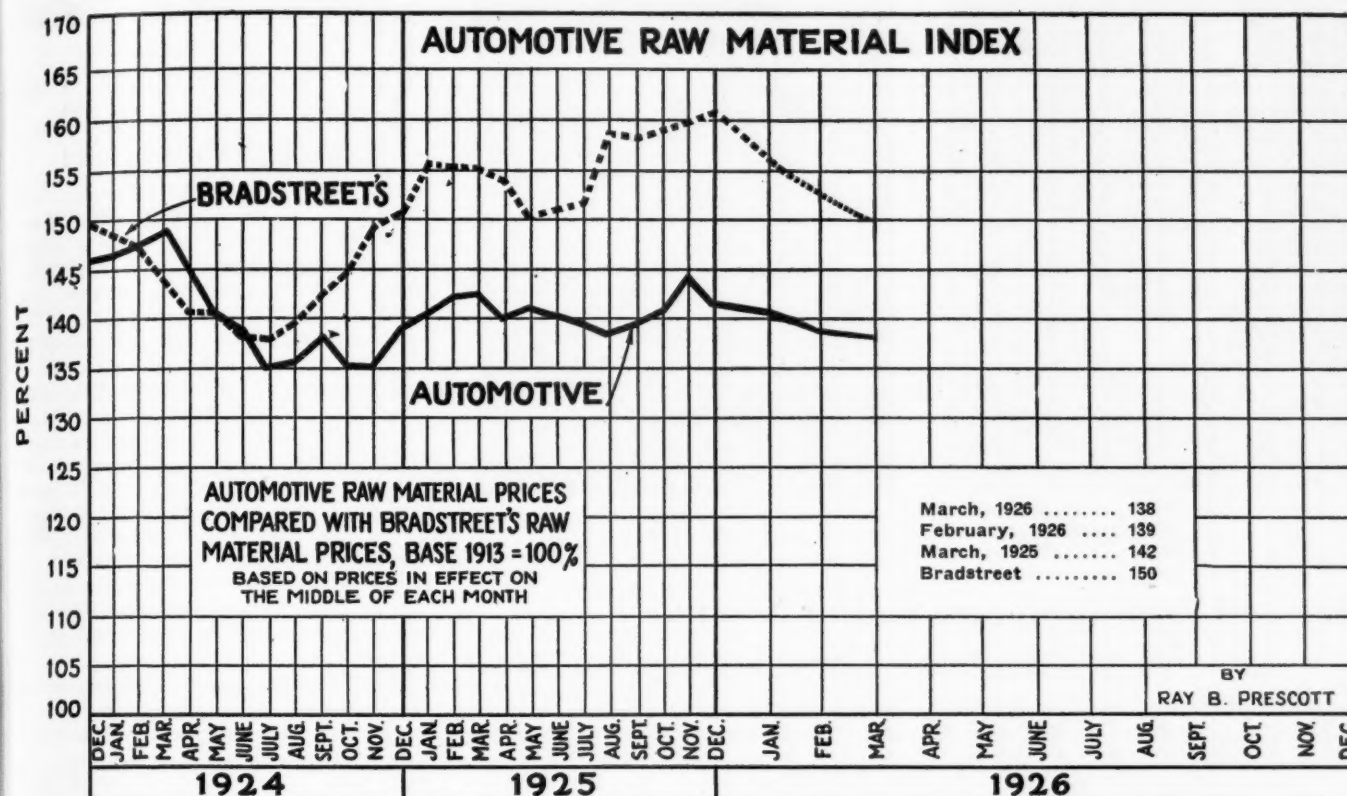
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March Raw Material Index Falls One Point



Buick Sales Gain in New York Zone

NEW YORK, March 27—From Jan. 1 to March 20 the New York branch of the Buick Motor Co. received 1968 orders and made 1289 deliveries to retail buyers, against 1278 orders and 983 deliveries in the 1925 period, a gain in orders of 54 per cent and in deliveries of 31 per cent.

Orders during the first 20 days of March were 788 against 505 last year, a gain of 56 per cent, and deliveries increased 39 per cent, from 515 to 719.

A. G. Southworth, branch manager, states that orders indicate unusually heavy April deliveries, with dealers stocks normal and well balanced cars for orders on all models.

Cadillac Doubles

DETROIT, April 1—Production of Cadillac cars for the past eight months is double the production for the corresponding period a year ago. Shipments from the plant have followed the same ratio and deliveries to customers delayed in many parts by unsettled weather conditions will be equalized at the same rate as soon as the weather permits, according to H. M. Stephens, general sales manager.

Kissel at Capacity

HARTFORD, WIS., March 27—C. A. Kissel, president of Kissel Motor Car Co., has returned from a three weeks' business trip to California and as a result of conferences with Kissel distribu-

tors expresses enthusiasm over the prosperous conditions in the territory covered.

The Kissel factory is operating at capacity. Deliveries are fairly prompt but are expected to run behind the Spring demand later.

Ford of Canada Sales Show 30 Per Cent Gain

FORD CITY, ONT., March 24—The Ford Motor Co. of Canada, Ltd., produced 10,502 cars and trucks in February as compared with 8035 in January and 7666 in February last year. Of the February production, 5560 vehicles were exported against 5013 in January.

The total output for the first two months was 18,537 compared with 14,275 for the corresponding period last year.

Oakland Output Up

PONTIAC, March 27—An increase of 4000 Oakland and Pontiac cars over the February production will be produced by the Oakland Motor Car Co. for March. This will bring the March output up to 12,000 cars.

The production for January was 5600 and February 8000. In 1925 the output of Oakland cars was 1800 in January, 2800 in February and 3500 in March.

Change Rouge Name

DETROIT, April 1.—The name of River Rouge plant of Ford Motor Co. has been changed to the Fordson plant at the direction of Edsel B. Ford, presi-

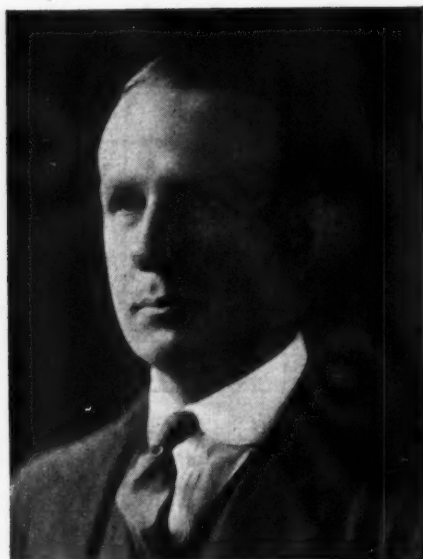
Graham Shipments Far Ahead of 1925

DETROIT, March 29 — Graham Brothers delivered 580 trucks and motor coaches for the week ending March 20. This is approximately 72 per cent better than the corresponding week for 1925. Deliveries since Jan. 2 and including March 20, total 4817, compared with 2567 for the same period in 1925.

Total shipments for Graham Brothers four factories at Detroit, Evansville, Stockton, and Toronto during the week ending March 20 amounted to 896 units, more than double the number of units for the same period last year. The shipments from the four factories from January 2 and including March 20 amounted to 5458 units, which is 50 per cent of their entire 1924 output. By the end of March, it is predicted by factory executives that shipments will equal those for all of 1923.

Franklin Retail Sales Higher in First Months

SYRACUSE, March 27—Franklin Automobile Co. reports retail sales for this year 32 per cent better than the corresponding period in 1925 and 45 per cent better than the same period in 1924. It was stated that this applies to retail sales in general throughout the country and the company is consequently looking forward to the best year in its history. The firm is now celebrating the 25th anniversary of its entrance in the automobile manufacturing field.



W. Ledyard Mitchell



K. T. Keller

Mitchell Promoted and Keller Named Vice-President Chrysler Corporation

DETROIT, April 1.—W. Ledyard Mitchell has been promoted to the position of vice-president and general manager of operations of the Chrysler Corp., by W. P. Chrysler, president. In his new position Mr. Mitchell assumes direction of all Chrysler operations in the three main Detroit plants and at Newcastle, Ind., and Dayton, Ohio.

Co-incident with the announcement of his appointment, Mr. Mitchell announced the addition to the executive personnel of K. T. Keller as vice-president in charge of manufacturing, which position Mr. Mitchell formerly occupied.

Mr. Mitchell entered the automotive industry in 1917 as president of the

former Maxwell Car Co. In 1922 he became vice-president in charge of manufacturing under the present Chrysler administration.

Mr. Keller in accepting the Chrysler appointment, resigns as vice-president and general manager of General Motors of Canada, Ltd. He entered the industry in 1910 and since that time has been in succession with the General Motors central office staff, general superintendent at Northway Motors, master mechanic at Buick Motor Co., manufacturing manager of Chevrolet Motor Co., and, latterly, vice-president and general manager of the General Motors interests in Canada.

Nafe Named to Head Dodge National Sales

DETROIT, April 1.—Robert C. Graham, vice-president and general sales manager of Dodge Brothers has announced the following appointments: A. E. Nafe, manager of service division to be head of the national business sales division, created to assist dealers in getting fleet business; H. M. Wiegand, chief inspector made service manager; F. R. Dalpey, sales manager for Graham Brothers, to be director of commercial car and truck division; R. W. Baskett to be superintendent of district offices and district personnel. E. S. Vandelson, formerly assistant superintendent of the forge and foundry division has been made Dodge Brothers factory manager.

Splitdorf Sales Gain

NEWARK, N. J., March 31.—Splitdorf-Bethlehem Electrical Co. and subsidiaries for the six months ended Dec. 31 report net profit \$158,028 or \$4.72 per share. Sales were about 75 per cent higher than the corresponding period in the previous year. Ratio of current assets

to current liabilities was about 2½ to 1. The ignition and accessory branch of the business are said to have shown great improvement while radio has proven a profitable allied line.

Export Men Sail

DETROIT, March 30.—O. S. Payne and Eric Nutt, of the New York office of General Motors Corp., will sail April 7 for England from where Mr. Payne will ship to Africa and Mr. Nutt to Bombay, India, to establish headquarters. Mr. Payne plans to spend a year visiting the branches which the General Motors Export Corp. has established on the east coast of Africa. Mr. Nutt will reorganize General Motors offices throughout India.

Goodman Joins Marmon

INDIANAPOLIS, March 29.—Announcement was made here yesterday that D. C. Goodman, former automobile editor of the Indianapolis Star, has been appointed advertising manager of the Marmon Motor Car Co. and has assumed his new duties.

Litchfield Becomes Goodyear President

New Executive Has Long
Record of Success—Two
New Directors Named

AKRON, March 29.—Following the annual stockholders' meeting today, directors of the Goodyear Tire & Rubber Co. elected Paul W. Litchfield president, succeeding the late G. M. Stadelman. Mr. Litchfield has been first vice-president of the company, and he is succeeded in that position by Frank K. Espenhain, hitherto vice-president in charge of sales.

E. G. Wilmer was re-elected chairman of the board, and C. F. Stone, C. E. Slusser and C. A. Stillman were made vice-presidents. Mr. Slusser will supervise production of all Goodyear plants outside Akron, and William Stevens becomes production superintendent at the Akron plant. Mr. Espenhain and Mr. Stone were added to the board of directors.

Mr. Litchfield is one of the veterans of the industry. He joined Goodyear in 1900 when the company was manufacturing carriage and bicycle tires. He built one of the first automobile tire plants and has since been responsible for hundreds of developments in the tire industry. In recent years he has been actively concerned in airship progress, and he recommended purchase of the several Zeppelin rights from Germany, and the subsequent establishment of the Goodyear Zeppelin Corp. He has been responsible also for the purchase by Goodyear of several cotton fabric manufacturing mills acquired recently and now in successful operation.

Make One-Piece Tube

NEW YORK, March 29.—A new inner tube has been placed on the market by the Twemco Corp., 250 East 57th St. It is molded by means of the Fairchild inner tube machine, in one piece, without the usual splice, and the elimination of the splice has made unnecessary an extra curing, hence the whole of the tube is single-cured. The valve is molded in at the time of curing and is claimed to be always correctly centered. Another advantage claimed for this tube is that it does not buckle on the inner side when in the cover.

Ban Outside Exhibits

NEW YORK, April 1.—The executive committee of the American Electric Railway Association has passed resolutions condemning exhibits or demonstrations outside the regular exhibit staged in conjunction with its conventions and has so notified its members and civic bodies in Cleveland in which its next convention will be held. October 6 has been designated as official exhibit inspection day at its coming Cleveland convention.

Production for Balance of Year May Run Near 1925 Average

(Continued from page 560)

BALTIMORE

Good weather in March helped to increase sales in the Baltimore territory, this increase being pronounced in the rural sections as well as in the city. The business improved as the month progressed and near the end, when the weather became decidedly spring-like for a few days, there was marked improvement. The reduction in government tax also is held to be responsible for increasing the demand for new cars.

Most of the dealers have their stocks in first-class condition and are ready for a big spring season.

Improvement also has been brought about in the used car situation. It is reported that none of the dealers are seriously handicapped by the used cars.

CHARLOTTE

A distinct element of uncertainty impelling conservatism, a slowly but steadily increasing demand for motor cars, some improvement in the used car situation, a continuing satisfactory wholesale and retail trade in accessories and replacement parts and tires featured the automotive trade in the Carolina territory early in April, according to reports assembled by the leading establishments here.

Weather conditions late in March served to materially depress the demand for new cars, but there were abundant evidences of an approaching large volume of sales.

The demand for motor trucks appeared to be subsiding somewhat, though a fairly satisfactory volume of sales was reported. The bus sales prospects are good, it was reported, but actual business is of unimportant volume.

In all lines the resistance to sales continues and the efforts of establishments dealing in all the various automotive lines to develop business is a feature of the situation.

LOUISVILLE

While new car sales in March were below expectations due to unseasonable weather, several dealers report sales above the same month last year and the total volume indicates that the local automobile market is in a healthy condition. Good weather in April may cause that month to set a record for new car deliveries. All indications point to exceptionally good spring business in the rural sections.

Used car stocks are rather heavy and moving slowly. The effects of low prices and easy financing terms are being felt in the used car field and a majority of

dealers are making strenuous efforts to keep used car stocks low.

Truck business is fair and showing improvement. Collections are satisfactory and repossessions low.

BIRMINGHAM

Automobile business in this city continues to hum, notwithstanding reported slackening of business in other lines. Dealers report steadily increasing sales during March and are confident that the condition will continue for at least another month.

Dealers in this section do not believe that there will be a slump in business here such as may be felt in other parts of the country. This State has never been busier with production and development than it is today.

The demand for used cars has been good and credit conditions are reported to be excellent by the companies handling the automobile paper.

NEW ORLEANS

"Exceptionally good" seems to be the word for the automobile business in this territory during March, with closed cars in demand especially in the larger communities and with the used car sales holding up well.

Some dealers report almost a record business in cars for March, with every prospect for even better business as the open spring weather approaches. The demand has been almost wholly for closed cars, until the last of the month, when in the rural communities a good demand has been registered for the open cars.

Dealers report fewer used cars on hand than any time during the year with the sales good.

Curtiss Gets Order

ALBANY, N. Y., March 27—The Curtiss Aeroplane & Motor Co. has been awarded a government order for airplanes which will keep the plant operating at capacity for several months. Croy Keys, of the Curtiss Co., stated that the order called for 35 Navy pursuit planes and pontoons calling for a large expenditure.

Detroit Labor Off

DETROIT, March 27—A decrease of 720 was recorded in the number of workers employed in the automotive plants in the Detroit district for the present week as compared to the week previous. According to the Employers' Association 271,414 were employed. This is 49,968 better than for the same period in 1925.

5-YEAR PROGRAM SETS 2200 PLANES

WASHINGTON, April 1—A five-year building program for the Army air service, to provide 2200 new planes at the end of that period, was approved unanimously this week by the House military committee, but no direct recommendation as to the amount of money to be expended was indicated.

The program is similar in scope to one recently approved by the House naval committee for the naval service, and sponsors of both expect them to be acted upon by the House before adjournment of Congress.

Industry Pay-Rolls Gain in February

WASHINGTON, March 31—An increase in the automobile industry of 2.2 per cent in personnel and 22.2 per cent increase in the pay rolls in February, compared with the month of January, is shown in the March statistical review of the U. S. Department of Labor, announced here this week.

The reports are based on returns from 203 automobile manufacturing concerns. The concerns had 334,967 workers on their rolls in January, which number increased to 342,347 in February. The January payroll was \$9,456,014, compared with \$11,556,338 for February.

Figures from the automobile tire industry in February show an increase of 1.0 per cent in workers and an increase of 5.7 per cent in salary. Reports were received from 64 manufacturers, employing 58,916 workers. The February payroll of this number was \$1,841,196.

Sunbeam Establishes New Kilometer Record

LONDON, March 17 (by mail)—On the sands at Southport (Lancashire) yesterday Major H. O. D. Segrave, driving the new twelve-cylinder Sunbeam racing car, beat the world's kilometer record (150.8 m.p.h.) made in July last year by Captain Malcolm Campbell, the latter also using a Sunbeam but one with a much larger twelve-cylinder (airplane) engine. Major Segraves time was 152.308 m. p. h.

The engine of this car has a piston displacement of 3.976 liters, the twelve cylinders having a bore and stroke of 67 x 94 m.m. and developing 300 b.h.p. at 5000 r.p.m., though speeds of 6000 r.p.m. have been attained without appreciable lowering of the torque curve above 5000 r.p.m. With the wheels and tires and the gear ratio used yesterday that engine speed equals approximately 156 m.p.h., but with the slightly larger tires that will be used later, 5000 r.p.m. corresponds with 162 m.p.h. without allowing for wheel slip, the gear ratio being 3 to 1.

Men of the Industry and What They Are Doing

T. J. Litle, Jr., Becomes Copeland Executive

Thomas J. Litle, Jr., formerly chief engineer of the Lincoln division of Ford Motor Co. and president of the Society of Automotive Engineers, has become associated with Copeland Products, Inc., Detroit, as vice-president in charge of engineering and development. Copeland Products, Inc. is a manufacturer of electrical refrigeration systems.

Mr. Litle has been affiliated with the automotive industry since 1916 when he joined the engineering department of Cadillac Motor Car Co., later becoming research and experimental engineer. He joined the staff of the Lincoln Motor Co. in a similar capacity, and subsequently was made chief engineer.

Previous to his automotive connection, Mr. Litle was chief engineer of the Welsbach company, during which connection he was credited with more than 100 inventions. He was honored at the Panama Pacific Exposition by the grant of a gold medal as a reward for research and development work in gaseous combustion.

Cleary Sales Manager

James M. Cleary has been named sales manager of the domestic department of the Studebaker Corp. of America, succeeding H. S. Vance, who has just been appointed vice-president in charge of production and engineering. Mr. Cleary has served as director of advertising and sales research and as assistant sales manager since joining Studebaker. He was formerly manager of the business survey department of the Chicago Tribune. He is well known in newspaper and advertising circles and has been active in the work of the American Newspaper Publishers Association.

Knight With Chevrolet

Fred Knight has been appointed sales representative for the Chevrolet Motor Car Co. in the Albany (N. Y.) district. He was formerly with the Hyatt Roller Bearing division of the General Motors. He has been identified with the automobile industry since the end of the war.

Rockwell Assumes Post

W. F. Rockwell, president and general manager of the Wisconsin Parts Co., Oshkosh, Wis., manufacturer of axles and other automotive units and parts, has been elected president of the Equitable Meter & Mfg. Co., Pittsburgh. This will not require a change of residence or interfere with his management of the parts company, it is stated.

Powers Joins Babcock

Kent S. Powers, formerly of the Standard Spring Mfg. Co., Minneapolis, has become associated with the Babcock Automobile Spring Co., Milwaukee, as vice-president and manager of the Milwaukee plant.

YELDELL ASSUMES COAST SALES WORK

SEATTLE, March 29—Walter H. Yeldell, secretary-sales manager and member of the board of directors of Gardner Motor Co., Inc., has established permanent headquarters on the Pacific Coast, it was announced during his visit in Seattle this week. He will make his home in San Francisco. Some time ago Mr. Yeldell visited Pacific Coast cities for the purpose of investigating trade and industrial conditions. The results of this survey so impressed him with the possibilities of Pacific Coast territory, that upon his return to the factory, he recommended closer cooperation between the Gardner factory and western distributors. His appointment to the new post followed.

Stegeman Resumes Sales

Oscar Stegeman, automotive engineer and charter member of the Society of Automotive Engineers, who has been identified with the car selling trade in recent years, has accepted the management of Rolls-Royce sales in the Milwaukee territory, according to announcement by the Sanger-Williams Co., Milwaukee, distributor. Mr. Stegeman, in the early days of the A. O. Smith Corp., was chief engineer, later going to the Palmer-Singer Co. as chief engineer and general manager. He returned to Milwaukee and engaged in the manufacture of motor trucks. After retiring from manufacturing, Mr. Stegeman became associated with the American Automobile Co., Milwaukee, distributor of the Pierce-Arrow, as sales manager.

Star Promotes Waller

Charles Waller, for the past year assistant sales manager of the Los Angeles branch of the Star Motors, Inc., has been appointed general manager of all branches in the metropolitan district, by Norman De Vaux, vice-president of the Durant Company of California. Mr. De Vaux also announced that the field of activities of Robert P. Fite, who has previously concentrated his energies in sales promotion of all Star branches in this territory, has been broadened and he is now in charge of the complete Southern California sales zone for the Star.

C. S. Ward Makes Change

Charles S. Ward, for the last two years manager of the Detroit branch of the Timken Roller Bearing Service & Sales Co., has resigned and effective April 1 becomes sales manager of the Detroit Ball Bearing Co. Mr. Ward brings to his new connection a wide experience and enjoys a large acquaintance both in Detroit and throughout the state of Michigan.

Colin A. Campbell Heads Stutz Sales Promotion

Colin Alfred Campbell has been added to the sales department of the Stutz Motor Car Co. of America, Inc., as sales development manager, according to an announcement by E. S. Gorrell, vice-president. Mr. Campbell, well known in the industry, is an admitted expert in territorial analysis.

Commenting on the appointment, Mr. Gorrell said Douglas Andrews will have charge of sales department activities up to and including signing of dealers and distributors and Mr. Campbell will have charge of sales from that point on.

"Our distributor and dealer expansion has been so phenomenal," Mr. Gorrell said, "that our needs have compelled us to accept the urgency of adding to our personnel."

Pratt Heads Sales

Harlan A. Pratt has been made manager of the oil and gas engine department of the Ingersoll-Rand Co. Mr. Pratt was connected with the sales department of the Westinghouse Electric & Mfg. Co., later becoming sales manager of the Atlantic Elevator Co. For the past three years he has been sales manager of the Elevator Supplies Co., Hoboken.

H. W. Curtis Resigns

H. W. Curtis, director of sales of the Durant Company of California for the past year, has resigned that position and established an independent Star dealership in Los Angeles. Mr. Curtis takes over the former Star factory branch at 21st and Main Streets.

Robinson Goes Abroad

George Robinson, once a winner of the Vanderbilt Cup Race and for the past year and a half with the New York Lincoln branch, sails April 3 for a nine months tour of Europe, during which he will visit Lincoln sales outlets in the interests of increasing this car's export business.

Butz With Indiana Ring

Joseph Butz, formerly research engineer with General Motors Corp., has become sales engineer of the Indiana Piston Ring Co., and will make his headquarters in the General Motors Bldg., Detroit.

Blakemore With Kissel

George A. Kissel, president of the Kissel Motor Car Co., has appointed Joseph Blakemore, well known San Francisco automobile man, to the post of California representative for the Kissel company.

Edson Mack Director

W. R. Edson has been elected a director of Mack Trucks, Inc., to succeed H. K. Pomroy, deceased.

Gleason to Make New Axle Gearing

Detroit S.A.E. Told of Development With New Pinion Shaft Location

DETROIT, March 30—In the near future the Gleason works of Rochester, N. Y., will announce a new type of rear axle gearing, the hypoid, with which the pinion shaft can be located from 1½ in. to 2½ in. above or, preferably, below the center line of the differential. This statement made by John Bethune was the outstanding feature of the meeting of March 25 of the Detroit Section of the Society of Automotive Engineers.

With the hypoid system of gearing the pinion will be considerably larger than the usual spiral bevel pinion. Tooth loads will be reduced to a degree permitting a reduction of around 14 per cent in the diameter of the ring gear. For the conventional location of the ring gear, the center of the pinion shaft will be below the center of the rear axle. While typical ring gear teeth have a spiral angle of approximately 10 deg. the angle of the pinion teeth will be around 40 deg. As a considerable amount of sliding action is introduced in place of the rapid accelerating rolling action where few teeth are used in the pinion, the hypoid system of gearing promises a greater degree of quietness than even the spiral bevel combination.

It is believed that the new system of gearing can be cut in modified Gleason spiral bevel machines although but one side of the teeth will be cut in a single machine and the opposite side will be produced in a duplicate machine. Smooth finish and accuracy will be improved as 16 cutters instead of 8 will be used for each side of each tooth.

Straight Tooth Gear Doomed

Before making this announcement, Mr. Bethune discussed gear boxes and gears of the present day. He stated that the doom of the straight tooth clash gear type has been sounded. As applied to use in the gear box the spur toothed gear is comparable to the straight tooth bevel gear which went into the discard more than ten years ago. Usual ratios, the sizes of the gears and the resultant arcs of action stand permanently against any possibility of obtaining quiet action.

Oil tempering steel is advocated against carbonizing stock and Mr. Bethune believes that the fewer times a gear is placed in the fire, the better are the chances of obtaining good results. Careful research should be devoted to procuring a steel which will not deform in heating and quenching. Experience at the Reo Motor Car Co. was cited to prove that such steel is obtainable and goes through heat treatment with closer subsequent limits in the bore than the usual production run of ground bores in ordinary gear stock.

With the use of this steel which is a special stock made by one company and

is approached by the S. A. E. specification No. 3250, Mr. Bethune advocates burnishing in the green rather than grinding of the teeth after hardening.

Stub teeth were condemned as producers of excess noise and Mr. Bethune urged careful study of long and short addenda for the purpose of obtaining the smallest amount of slide and equalizing wear. In his opinion a cluster gear with bearings at the end is preferable to the through shaft and bushing arrangement.

The possibilities of adoption of internal gears to the gear box were urged and he showed a step down gear of planetary type consisting of two external and two internal gears. This assembly produces a change from 3.9 to 5.9 to 1 total reduction without any noise. While this combination has possibilities of a three speed gear set, he has been unable to work out the details of control. This planetary unit will transmit the full torque of the engine although the gears are 10-12 pitch. As a general rule smaller pitches are recommended for gear box service.

Los Angeles Section Holds Brake Meeting

LOS ANGELES, March 27—Braking efficiency was the principal subject of discussion at the recent meeting of the Southern California section, Society of Automotive Engineers, held in Los Angeles. John Wiggers, chief engineer of the Moreland Motor Truck Co., presented a paper on brake construction, operation and maintenance, and Ethelbert Favary, secretary of the section, spoke on "Mathematical Analysis of Brake Requirements."

Mr. Wiggers traced the development of brake designing to its present state of efficiency, describing the advantages and defects of the various systems. Mr. Favary showed by experiments how the coefficient of friction of any material may be found, and how brake requirements may be analyzed by simple mathematics.

S. A. E. April Meetings

NEW YORK, March 29—The following schedule of April section meetings and their topics, has been announced by the Society of Automotive Engineers: 6th, Buffalo Section, Thermo Vapor Cooling System, C. H. Kenneweg; 7th, Milwaukee Section, Chassis Lubrication, Fred H. Gleason; 8th, Dayton Section, Roots Type Superchargers, A. W. Gardiner; 8th, Indiana Section, Worm Drive Axles for Passenger Cars, L. Ray Buckendale; 9th, Southern California Section, Diesel Engines for Automotive Purposes, T. B. Danckwortt; 13th, Pennsylvania Section, Motor Front End Drive, Frank M. Hawley, R. S. Drummond, E. F. Behning; 15th, Metropolitan Section, Engines, H. M. Crane; 19th, Cleveland Section; 23rd, Chicago Section, Motorized Rail Car Development, A. W. Scarratt; 23rd, Washington Section, Gasoline Production by the Vapor-chase Cracking Process, W. G. Leamon.

Motorists Protest Unfair Legislation

Adopt Bill of Rights Citing Discriminatory Conditions— 500,000 Unfair Arrests

WASHINGTON, March 27—Motorists are becoming disgusted with the treatment accorded them by public officials, it was declared here this week at the National Motor Congress participated in by executives from 300 motor clubs throughout the country, meeting under the auspices of the American Automobile Association.

This primarily was the tenor of the three-day session which was concluded by the adoption of a "bill of rights" to protect car owners and motorists against the discrimination to which they are now subjected. Figures compiled by the A. A. A. statistical department estimated that approximately 500,000 motorists were arrested last year "without cause or provocation."

The overwhelming sentiment of the Congress was that traffic safety would be enormously advanced if legislatures proceeded along simple and sane lines instead of introducing, as during the past year, something like 3,000 laws to regulate motor vehicles.

Among the points stressed in connection with the bill of particulars was: First, that taxation of motor vehicles must be simplified so that the car owner will know what agency is to tax them and for what purpose they are to be taxed; (second) that the roadside squire and his henchman must be abolished, and (third) that the practice of giving everybody but the motorist the benefit of the doubt must be abandoned.

Manifold Temperature Makes Fuel Efficient

SAN FRANCISCO, March 27—The San Francisco Chapter of the S.A.E. heard an interesting plea for the standardization of intake manifold temperatures by the manufacturers, from W. S. James, assistant technologist of the Associated Oil Co., at the monthly meeting of the San Francisco Chapter on the night of March 17, taking for his subject "Gasoline Volatility." After discussing a number of experiments conducted by himself and others, Dr. James said, in part:

"The temperature in the intake manifold necessary for satisfactory vaporization is possibly 150 deg. Motor fuels are standardized today to a remarkable degree; that is their vaporization takes place at about the same temperatures, and the chief reason for unsatisfactory operation is non-uniformity of inlet temperatures. If, for example, all engines ran best at 175 to 180 inlet temperature, and were so built that such temperatures could be maintained, we would have little of the dilution which now annoys us. One gasoline would then suit all engines."

Moon 1925 Income Shows Sharp Gain

ST. LOUIS, March 30—Net income of Moon Motor Car Co. for 1925 was \$1,102,828 after depreciation and Federal taxes, equivalent to \$6.13 a share on the 180,000 no par capital shares. This compares with a net income of \$559,585 or \$3.11 a share in 1924. Business was conducted on an average inventory of \$1,395,000 with a turnover of 8.7 times. Sales of the Diana models, introduced in July, added materially to the company's earnings, officers said.

The balance sheet as of Dec. 31, 1925, shows current assets of \$2,371,623 as against \$1,864,522 in 1924. Current liabilities were \$550,480 at the end of 1925 and \$350,962 the year previous. Net working capital was \$1,821,143, as compared with \$1,513,560. Cash at the close of 1925 totaled \$337,576; receivables \$551,757 and inventories \$1,457,890. In 1924 these items totaled \$420,061, \$231,596 and \$1,309,570 respectively. Total assets were \$3,663,887 as against \$2,892,034 the year before.

The Moon company this year is celebrating its twentieth anniversary. The most important progress has been in the past six years in which period sales have totaled \$52,266,350. Total production during this time were 52,050 cars of which 10,675 were exported. Total earnings of the company during this period were \$4,402,008, or a profit ratio of 8.85.

Formica Adds Plant

CINCINNATI, April 1—Formica Insulation Co. will move into a new building in May which will be operated ex-

clusively as a gear department, containing equipment for cutting, sewing, assembling molded gears and presses in which they are produced. Increasing use of non-metallic timing gears has made necessary expansion, the company declares. The new unit will be 80 x 100 ft., two stories high, but foundations provide for three additional stories as they are required.

Packard Net Income Triples in Quarter

DETROIT, March 27—For the quarter ended Feb. 28, Packard Motor Car Co. reports net income \$3,122,849 after charges, equal to \$1.19 a share on the 2,614,722 shares of \$10 par common outstanding and comparing with \$1,081,092 or 38 cents a share in the corresponding period a year ago.

Net income for the six months ended Feb. 28 was \$8,002,358 or \$3.06 a share compared with \$2,954,745 or \$1.07 a share in the same previous period.

Auto-Lite Favorable

TOLEDO, March 26—Electric Auto-Lite Co. stockholders have approved a plan to purchase the starting, lighting and battery ignition business of the American Bosch Magneto Corp., whose stockholders will vote on the question next month.

Parts Men Invited

DETROIT, March 29—An invitation has been extended to overseas distributors of motor vehicles, replacement parts and accessories by the National Standard Parts Association to visit their annual convention and exhibit to be held Nov. 15 to 19 at Chicago.

Financial Notes

Bohn Aluminum & Brass Corp. shows an increase in current assets to \$2,778,624 in 1925 from \$2,314,708 in 1924, and a decrease in current liabilities to \$995,674 from \$1,128,709. Cash shows a decrease to \$65,221 from \$109,759, while accounts receivable increased to \$998,089 from \$748,093 and inventory increased to \$1,686,914 from \$1,433,406. Net working capital was increased to \$1,782,950 from \$1,185,999.

Michigan Drop Forge Co. will pay a liquidating dividend of 50 per cent on its preferred stock upon presentation of certificates at the Union Trust Co., Detroit.

Wildman Rubber Co. is arranging for a fund of \$500,000 of which about \$230,000 will be used for the completion of its Bay City, Mich., mill.

Watson (John Warren) Co. has awarded a contract for a new plant to cost \$300,000 with equipment.

Autocar Co. has postponed its annual meeting until April 9 at which time it is expected that action will be taken on plans for refinancing.

Glass Mobile Corp., Class A common stock is being offered by Detroit brokers at \$20 a share, each share carrying a detachable warrant entitling the holder to purchase one share of class B stock at \$7.50 prior to July 1, 1927, and at higher prices subsequently. The proceeds of the sale is to be used for business expansion.

Electric Storage Battery Co. has made application to list 25,000 additional shares on the New York Stock Exchange. This represents stock provided for employee subscription. The fourth annual offering to employees is to be made this year and payments on the first offering completed.

Developments of the Week in Leading Motor Stocks

NEW YORK, April 1—Further severe breaks in Stock Exchange prices occurred during the past week carrying quotations to the lowest levels of the year and cancelling in a few days the gains which it took several months of rising prices to accomplish. It was a liquidating market in which stocks were sacrificed for whatever prices they would bring and the volume of trading reached record levels. High-grade investment stocks declined as easily as did the more volatile speculative issues. Margin calls were numerous and forced selling to protect weekly margined holdings was in evidence throughout the week.

Opinion is divided as to whether the setback in the stock market is predicting, as it usually does, a general slump in business and there are good reasons for believing that this is not the case. Some months ago the opinion had been freely voiced that there had been considerable inflation in the stock market apparently not justified by expansion in general business. Annual reports of many companies which have been published in the past few weeks have brought home to

stockholders the fact that in many cases the earnings results of 1925 did not justify the boom in prices of some stocks. The same inflationary tendency apparently does not exist in industry. Inventories are moderate, cash holdings of the country's biggest corporations are at record levels and profit margins appear reasonable with selling prices comparatively low. This is particularly true of the motor companies. In view of this situation some authorities believe that the worst that can occur in the business situation is a moderate recession from recent record-breaking volume and profits unaccompanied by the severe losses which would follow deflation such as was necessary in both the stock market and business in the 1919-20 boom. It is therefore likely that after the speculative structure as expressed in stock market prices has been readjusted to more normal levels, business will be found going on as usual with securities selling more in line with intrinsic values rather than with extremely optimistic prospects.

Motor stocks fell off sharply in sympathy with the rest of the list, mak-

ing new low prices on the movement. Hudson, General Motors, Chrysler, Mack Trucks and White Motors showed the largest losses and of these Hudson showed the greatest weakness declining to under 70 as compared with a high price in 1925 of 139½. General Motors lost more than 10 points to under 115 but is still selling several points above the low price made on the November break. Both Mack Trucks and White Motor registered new low prices.

Some impetus was given to the decline in motor stocks by reports that W. C. Durant had been a heavy seller of stocks in recent weeks. Weakness in stocks like Hudson and Stewart-Warner, which declined 10 points to the lower 70s, with which his name had been freely connected when these issues were advancing several months ago, lent color to the reports by the ease with which they declined to lower levels.

Notwithstanding the decline in the motors, reports on the industry fail to show any marked evidence of a falling off in business which throughout March continued to break all records.—E. S.

Exports, Imports and Reimports of the Automotive Industry for February, 1926,
and Total for Eight Months Ended February, 1926

		EXPORTS				Eight Months Ending February			
		Month of February				1925		1926	
		1925	Value	1926	Value	Number	Value	Number	Value
		Number		Number					
Automobiles and parts (total).....		..	\$18,595,110	..	\$29,096,523	..	\$135,570,112	..	\$217,638,226
Electric trucks and passenger cars.....		4	10,620	4	2,665	91	128,028	62	93,629
Motor trucks and buses, except electric:									
Up to 1 ton		418	573,386	1,074	1,399,796	9,403	3,847,905	7,941	10,012,401
Over 1 and up to 2 1/2 tons		94	246,880	163	627,872	3,557	4,807,201	1,300	4,163,165
Over 2 1/2 tons		2,151	1,561,543	5,877	4,114,432	980	2,533,827	46,349	29,956,126
Total motor trucks and buses, except electric						17,917	12,811,113		
PASSENGER CARS									
Passenger cars, except electric:									
Value up to \$500, inclusive.....		5,320	2,028,591	11,017	4,020,071	38,976	14,340,100	78,707	29,437,500
Value over \$500 and up to \$800.....		4,193	3,016,791	5,011	3,438,557	26,263	18,573,165	38,620	27,392,106
Value over \$800 and up to \$1,200.....		3,691	3,915,125	4,905	5,245,519	22,761	26,749,809	39,985	42,206,519
Value over \$1,200 and up to \$2,000.....		1,210	1,793,883	972	1,440,580	7,349	7,806,831	9,106	13,691,675
Value over \$2,000.....		325	899,032	450	1,233,068	2,636	3,922,117	3,245	8,897,658
Total passenger cars, except electric.....		14,739	11,653,422	22,355	15,377,795	100,323	77,963,667	169,662	121,625,458
PARTS, ETC.									
Parts, except engines and tires:									
Automobile unit assemblies (Lbs.).....		..	2,010,806	..	4,831,986	..	20,312,866	..	27,707,980
Automobile parts for replacement (Lbs.).....		..	1,687,914	..	2,454,023	..	13,725,380	..	20,481,391
Accessories (Lbs.) .....		..	484,101	..	656,178	..	4,229,515	..	5,919,115
Automobile service appliances (n.e.s) (Lbs.)		..	247,697	..	437,955	..	2,233,698	..	4,047,959
Station and warehouse motor trucks (No.)..		5	2,650	7	8,267	97	50,282	78	74,025
Trailers (No.)		33	20,500	99	29,365	427	153,001	605	226,383
Airplanes, seaplanes and other aircraft (No.)		2	2,000	2	19,650	20	150,661	31	324,825
Parts of airplanes, except engines and tires									
(Lbs.) .....		..	28,819	..	19,371	..	80,760	..	64,911
BICYCLES, ETC.									
Bicycles and tricycles (No.).....		704	19,239	324	10,764	4,983	124,927	4,477	127,751
Motor cycles (No.)		1,960	451,968	2,492	537,071	11,162	2,552,331	15,165	3,287,677
Parts, except tires (Lbs.).....		..	105,128	..	164,462	..	975,394	..	1,122,728
INTERNAL COMBUSTION ENGINES									
Stationary and portable:									
Diesel and Semi-Diesel (No.).....		64	31,586	30	145,801	705	290,047	1,159	863,340
Other stationary and portable:									
Not over 10 H.P.....		1,635	159,209	1,906	161,867	18,701	1,824,655	19,259	1,671,063
Over 10 H.P.....		105	119,657	194	159,531	1,355	1,113,534	2,028	1,659,596
Automobile engines for:									
Motor trucks and buses		4,910	461,903	47	23,162	15,660	1,347,971	10,883	1,011,814
Passenger cars		4,494	477,104	13,280	1,198,327	22,924	2,817,874	64,462	6,794,754
Tractors		6	718	244	86,191	2,050	637,575	1,424	567,955
Aircraft		1	100	568	57,124	40	61,030	626	185,475
Accessories and parts (Lbs.).....		..	219,881	..	276,617	..	2,038,307	..	2,561,925
IMPORTS									
Automobiles and chassis (dutiable).....		44	122,296	38	97,706	360	584,317	527	719,799
Other vehicles and parts for them (dutiable)		..	62,369	..	5,473	..	441,759	..	456,883
REIMPORTS									
Automobiles (free from duty)		42	65,082	12	16,666	430	636,428	129	204,632

Set Gasoline Sales
at Billion Monthly

NEW YORK, March 30—Total consumption of gasoline, domestic and foreign, last year is estimated at about 10,700,000,000 gallons, compared with 9,000,000,000 in 1924.

Consumption of about 1,000,000,000 gallons a month is expected this year, including about 100,000,000 for export. This estimate is based on a normal gain in the number of automobiles this year over the approximately 20,000,000 in use last year.

Gasoline consumption in January this year was 864,000,000 gallons compared with 694,000,000 gallons in January, 1924, and buying for export is on the increase. At the end of January, stocks on hand were estimated at 1,750,000,000 gallons, or 399,000,000 more than at the same period last year. Stocks at present are estimated at about 1,900,000,000.

Gasoline More Uniform

WASHINGTON, April 1—The thirteenth semi-annual survey of motor gasoline by the Bureau of Mines again confirms the tendency toward uniform-

ity which has been noted for the past several years, the decrease in difference between "end points" of several gasoline groups indicating the trend. The Bureau notes that there is apparently a distinct difference between winter and summer gasoline, the gasoline marketed during the winter being more volatile than that sold during the summer.

Tire Exports Show
February Increases

WASHINGTON, March 31—A slight increase in the value of rubber tires exported in February, over the previous month, is shown by the February export figures, just announced here by the U. S. Bureau of Foreign and Domestic Commerce.

February average per casing was \$15.95, compared with \$15.66 for January. Total casings exported were 133,993, having an aggregate value of \$2,136,783.

Solid tires per unit value in January were \$34.72, compared with an increase in February to \$35.40. Inner tubes showed practically no change in unit value of \$2.89. Total volume of 86,848 tubes, valued at \$280,015 were exported.

Used Rubber Stands
Replacement Tests

WASHINGTON, March 27—Tire treads in which 25 per cent of the normal rubber content has been replaced by reclaimed rubber, according to experiments just concluded by the U. S. Bureau of Standards, will give an average of 7,000 miles on the road. On account of the still prevailing high prices of crude rubber the Bureau is carrying on considerable experimental work with a view of replacing it with reclaimed rubber.

"The Bureau," states a report just issued on reclaimed rubber experiments, "plans to carry out a similar investigation on the use of reclaimed rubber in the carcass of tires. This is the part in which the design is most exacting and in which a small change may have a large influence on the tire's life."

"For this reason manufacturers have hesitated to use any material other than new rubber," the report continues. "Preliminary dynamometer and endurance tests which the Bureau has conducted of tires manufactured in this manner indicate that the use of reclaimed rubber may be entirely feasible."

Steel Makers Seek Spurt in Car Sales

Look to Industry to Provide
Needed Momentum—Prices
Continue Firm

NEW YORK, April 1—Ordinarily it isn't considered good policy to "bid the devil good morning till you meet him," but the steel industry always believes in taking time by the forelock, and so the outstanding topic of discussion in steel circles this week is when will be felt the full force of the slowing up of operations that is generally looked for. No one seems to expect that a miracle will happen, and that the rate of mill operations will not have to be pared, but some believe that the tapering-off will be slight while others are prepared for a more severe downturn.

Perhaps never before have steel producers scanned the horizon so eagerly as now for signs of a spurt in passenger motor car sales. It is astonishing how many steel men in one breath make light of the steel tonnage absorbed by the automotive industries, and in the next utter the fervent hope that automobile demand will prove itself in the next two months to have been merely backward, and that its recrudescence will furnish that momentum for steel demand which steel producers have come to look for to the automotive industries in spite of what they may say about the extent of automotive tonnage consumption of steel.

Leading rolled steel products, such as strip steel and full-finished automobile sheets, hold steady in price, and mills have a comfortable quota of specifications on their books. Cold-finished steel bars are likewise on an even price keel. The backlog of automotive orders on alloy-steel makers' books is not as large as these producers would like to have it, but operations are continued at a fairly high rate in the hope of early replenishment.

For all these untoward conditions and conjectures, producers resist attempts of purchasing agents to secure concessions. Many of the smaller market factors are keenly disappointed that the recent high operating ratios were not accompanied by corresponding price advances, and while they would like to secure a more free flow of orders, they do not believe that concessions would bring out a single ton above routine, hand-to-mouth requirements.

Pig Iron—Some automotive melters are apparently not convinced that, in spite of all that has been said about production costs, prices will not yield further, and are holding off, making only single-car commitments. Lake Superior iron ore prices for 1926 are unchanged from 1925. Scrap iron rules firmer, but not higher.

Aluminum—Relatively heavy shipments of ingot metal continue from Ger-

many, but there appears to be a temporary recession in Norway's contribution to the American market. Routine conditions prevail in the market, prices being unchanged and steady all along the line.

Copper—When the red metal broke through the 14 cent level last week, reductions for all copper and brass products, except wire, went into effect. In the face of efforts by American producers to lift prices through an export combine, London is fighting hard to "bear" the market.

Tin—Slightly lower prices have been chalked up, but on the whole, American consumers continue to be at the mercy of an Anglo-Indian tin famine propaganda.

Lead—The "outside" market is slightly higher.

Ford Portland Branch to Use Columbia Tire

PORTLAND, ORE., March 27—According to an announcement today by F. H. Hull, manager of the Portland branch of the Ford Motor Co., a contract has been awarded the Columbia Tire Corp. whereby the Ford cars assembled in the Portland Ford factory will be equipped with these tires.

According to R. A. Wurzburg, president of the Columbia Tire Corp., this new business will mean that the plant must immediately add a night shift to supply the tires needed by the Ford factory, in addition to the production necessary to satisfy the growing replacement demand.

The first Ford cars equipped with the local tires will be in production and distributed to dealers about April 1, and it is anticipated that a production of about 120,000 tires per year will be necessary to cover the Ford requirements alone.

Tire Imports Drop

NEW YORK, March 27—In February 269 tires, valued at \$5022, were imported into the United States, according to the Rubber Division of the Department of Commerce, compared with 791 tires, valued at \$13,049 imported in January.

Tires imported from France, Great Britain, Canada and other countries in 1925 showed a marked decrease from 1924 figures. The number of tires decreased from 183,586 to 21,139 and their value fell from \$1,098,715 to \$263,185.

Export Trade Grows

BALTIMORE, April 1—Export business of the Black & Decker Mfg. Co. for 1925 shows an increase of 171 per cent over the previous year. Business in the early months of 1926 shows a further gain of approximately 60 per cent. Under direction of E. D. Allmendinger the company has established a much broader distributing organization in the foreign field, only recently establishing the Black & Decker Mfg. Co., Ltd., London, England, with Cecil M. Peter as managing director.

Second-Grade Tires to Cut Rubber Use

Exchange Prices Show Narrow
Fluctuations—Conservation
Means Early Replacement

NEW YORK, March 27—With Rubber Exchange prices showing narrow fluctuations this week and quoted today around 58.60 for May and 57.60 for July, Henderson, Helm & Hammesfahr, Inc., says that tire sales are not showing the satisfactory results normal weather would justify and that weather conditions have not been generally conducive to motoring recently.

Present ratio of second grade tire sales is expected to have a material effect on rubber consumption this year in a reduction in all sizes and grades averaging nearly two pounds of crude rubber per tire on total production estimated at 60,000,000 tires with consequent reduction of about 50,000 tons of rubber consumed. The company estimates rubber consumption this year at about 360,000 tons.

"With practically the full production of rubber permitted today," the firm says, "rubber will find its proper price level, and in spite of all arguments to the contrary, the requirements of this country will largely influence the price level for this year at least. The cheapening of tire construction will accomplish the necessary conservation this year even though it may bring an accumulated demand through earlier replacements of tires next year."

Wico Electric Opens British Branch Factory

SPRINGFIELD, MASS., March 29—Wico Electric Co. has opened a branch factory in London for the manufacture of magnetos to serve the markets of the United Kingdom and Continental Europe. Other fields will continue to be served from the home plant, whose operations also are to be enlarged. A section of the building hitherto used for storage is being made ready for production and additional machinery will be installed so that the capacity will be largely increased. The London plant has been installed in a building having 18,000 feet of floor space. It is stated that this will be used principally for the development of new business under the more favorable tariff and transportation conditions provided. The company is now bringing out a new magneto for four-cylinder motors.

Locate Coast Chain

LOS ANGELES, March 29—Thomas M. Ray, vice-president of the Federal Motor Truck Co., of California, has completed the establishment of a chain of factory branches along the Pacific Coast, extending from Seattle south. The expansion program was carried out under the personal direction of Mr. Ray.

Bendix to Produce 12,000 Brakes Daily

Company Now Set on Expansion Plans—Two Months
Sales Exceed All 1925

CHICAGO, March 26—Net income of the Bendix Brake Corp., including the Bendix Brake Co. among the subsidiaries, was \$137,610 in 1925, compared with \$204,261 in 1924. The reason for the decrease, the stockholders were told at the annual meeting, was the expansion and sales expense in the brake division during the last year.

Income from royalties totaled \$421,797 compared with \$387,331 in the previous period. Sales were \$332,268 in addition to the royalties during 1925. Expenses showed a gain from \$144,008 in 1924 to \$595,975 in 1925, which indicates the expenditures made to increase the manufacturing facilities in the brake division and to create a favorable market for this product.

The executive personnel of the company was changed with the election of Orville W. Thompson, of J. P. Marsh & Co., and E. O. Bendix, to the board of directors, succeeding Henry Rudkin and J. F. Price. E. O. Bendix was elected vice-president of the company succeeding Mr. Price.

An optimistic note is contained in the annual report of Vincent Bendix, president and general manager of the corporation. He told the stockholders that in the first two months of 1926 brake sales have totaled more than the amount realized from this source in all of 1925.

The report says that during the last year the company has obtained orders to supply Bendix brakes as standard equipment on the following cars: Cunningham, Hertz, Hupmobile 6, Locomobile Junior, Locomobile 33-90, Overland 93 (export), Packard 6 and 8, Star 4 and 6 of California, and Stearns.

The report further states that the company is now developing its plant facilities to handle the manufacture of 12,000 brakes per day. During the last year additional buildings have been erected at South Bend which increase the floor space 500 per cent.

Norton at Moline

MOLINE, ILL., March 27—A western plant of A. O. Norton, Inc., Boston, a subsidiary of Borg & Beck Co. and manufacturers of heavy duty lifting jacks, will be located here, occupying the plant in which the Borg & Beck company launched its business, but which has lately been utilized by the Moline Foundry & Machine Co. for factory purposes. The latter concern is starting work upon a three story plant of its own on property adjoining the Borg & Beck factory. J. W. Hobbs, vice-president of the Norton concern, is here this week opening up the plant which will be under George H. Simpson, general superintendent.

REGISTRATIONS NET \$260,619,621 IN 1925

WASHINGTON, Mar. 25—Total motor registration in the United States on Jan. 1 was 20,051,276, according to the Federal automotive census made by the Federal government and announced here through the U. S. Bureau of Public Roads. Of the total 19,954,347 were privately owned cars and trucks, while 96,929 vehicles are owned and operated by the states and Federal government, as of Jan. 1.

The total revenue from registration fees, permits, etc., according to the Federal census, amounted in 1925 to \$260,619,621, of which \$177,706,587 was made available for State Highways; \$19,124,014 for State road bonds and \$48,394,471 for local roads.

Sanderson Drill Buys Akron Motor Company

ORRVILLE, OHIO, March 27—Sanderson Cyclone Drill Co. has announced the outright purchase of all drawings and patterns, special machinery, tools and jigs, inventory and good will of the motor division of Wellman-Seaver-Morgan Co., manufacturers of stock engines, formerly located at Akron. All the physical property of the company has been moved to the factory of the Sanderson company at Orrville, where the engines are now being built and serviced.

In making this purchase the services of a number of men connected with the Morgan division have been retained. John Riise, formerly chief engineer and largely responsible for the design and development of these engines now holds the same position with Sanderson. In addition the services of the shop superintendent and the foremen of the machinery, erecting and testing departments have been continued. The new plant is located on a 35 acre tract on the outskirts of Orrville.

Globe Adds to Plant

MILWAUKEE, March 29—Constantly growing demands from the automotive industries as well as other lines are compelling the Globe Steel Tubes Co. of Milwaukee to make further material enlargement of its facilities. Purchases of new machine tools and other equipment costing \$300,000 are now being made, supplementing the installation of equipment costing \$250,000 during 1925. About 50 per cent of the output is being absorbed by the automotive trade.

Prepare Bus Plant

SPRINGFIELD, OHIO, March 27—C. F. Orcutt of the American Bus & Truck Co., reports that by July the big plant will be in shape to go ahead under full production. Many changes are being made in the plant and products.

Detroit Selected for Fageol Bus Site

Car and Foundry to Center
\$24,000,000 Development
at Plant There

DETROIT, March 26—American Car & Foundry Motors Co., combining resources and staff of the Fageol Motors Co., Kent, Ohio, and Hall-Scott Motors Co., Berkeley, Cal., in a \$24,000,000 development, has decided to locate its main plant for the manufacture of buses and motor coaches in Detroit.

This is the announcement of S. C. Sale, president of the new combination.

The American Car & Foundry plant at Russell and Ferry, comprising 45 acres, will be placed in operation at once and will, within 60 days, be placed on a working schedule of 15 units daily.

The J. G. Brill Co. is also represented in the new organization by its president, S. H. Curwen.

Col. E. J. Hall, known with Col. J. G. Vincent for designing the Liberty motor, will locate in Detroit and will have charge of operations as vice-president of engineering. F. R. Fageol, pioneer of the bus and coach bearing his name, will act as vice-president of sales with headquarters in New York.

In addition to motor buses, which will include the new gas-electric and the new rail car type, the company plans to manufacture airplane motors of the Hall-Scott type, Hall-Scott bus motors and the Hall-Scott motor for boats.

Besides the above named officers, W. H. Woodin, president of the American Car & Foundry Co., is chairman of the board of directors. W. L. Stancliffe, G. R. Scanland and Horace Wager are vice-presidents; W. E. Wick is secretary and S. A. Mallette, treasurer. Paul Weeks is the chief engineer and Frank Whitten is designing engineer.

Five are Awarded First Ross Medals

LAFAYETTE, IND., March 26—Award by Ross Gear & Tool Co. for the best letter telling how a demonstration of Ross steering gear helped close a sale, was given to W. F. Knapp, sales manager of Fred T. O'Neill, Hupmobile distributor in Syracuse, N. Y. Second prize of \$50 went to Paul Jacobs, Peerless salesman of Johnstown, Pa. T. S. H. Godwin of the Philadelphia branch of Sterling Motor Truck Co., E. E. L. Hutton, Diana salesman of Detroit, and O. B. Opheim, Eau Claire, Wis., won the other prizes in the order named.

New Stratton Name

NEW YORK, April 1—The name of the Stratton-Bliss Co., distributor of Oakland and Pontiac cars in the metropolitan territory, has been changed to H. L. Stratton, Inc., as of this date. The company was originally the Colt-Stratton Co. and has been distributing cars in New York territory since 1909.

Harvester Profits Reflect Farm Gain

CHICAGO, March 27—"Agricultural conditions in the United States have shown some improvement," says Alexander Legge, president, in the annual report of the International Harvester Co. and affiliated companies. "We must keep in mind, however, the fact that the purchasing power of the American farmer is still considerably below that of people engaged in other occupations. This situation must be further improved if business prosperity is to continue."

The report shows net income for 1925 of \$19,171,240 after charges, equal after preferred dividends to \$14.83 a share on the 998,767 common shares, and comparing with \$13,037,395 or \$8.81 a share in 1924.

On Dec. 31 current assets were \$189,039,524 compared with \$167,651,473 at the end of 1924 and current liabilities \$28,675,953 compared with \$19,335,885, leaving net working capital of \$160,363,571 compared with \$148,315,588. Net profits represent about 8 per cent on the capital invested in the business.

Mellinger Western Offices

OAKLAND, CAL., March 27—The Mellinger Tire & Rubber Co., of Kansas City and Philadelphia announces that it will locate its western division headquarters here.

A building has been leased and the 4,000 agencies in California, Oregon, Washington, Nevada, Arizona, Utah and Idaho will be served from this headquarters and warehouse, according to B. L. Mellinger, president. R. H. Shull, western division manager, will be in charge of the local plant, which will be opened for business April 1. The western agencies have been served heretofore by the Kansas City offices.

Coming Feature Issues of Chilton Class Journal Publications

May—Automobile Trade Journal—Biggest Market Issue.

May 6—Motor Age—Sales and Service Reference Number

Hertz Says Rentals Will Outstrip Taxis

ST. LOUIS, March 27—Declaring that the possibilities in the business of supplying automobiles to individual drivers at a certain fixed rental are almost unlimited, John Hertz, taxicab and motor bus manufacturer and operator, predicts that the rental business will outstrip taxi operation five to one in the next few years.

Hertz, who is developing a countrywide "drive-it-yourself" plan, predicts that within 90 days it will be possible for a man to walk from his office in St. Louis to a rental station, take out a car, drive it to Chicago or New York, pay his rental charge at his destination, and proceed about his business. Hertz is developing this plan at his Chicago, New York and St. Louis stations and plans to put it in effect this summer.

Locate Coast Branch

SAN FRANCISCO, March 27—A direct factory branch of the Harvey Spring & Forging Co., Racine, is to be established in San Francisco, with George F. Howe as manager and G. R. Waddell as local sales representative, according to announcement here by T. H. Van Horn, general sales manager of the Harvey company. The Pacific Slope and the Hawaiian Islands will be served.

Truck and Bus Aid Mexican Prosperity

LOS ANGELES, March 29—J. B. Affan, of Cia Commercial Hamburguesa, leading distributors of motor cars and trucks in Mexico, who is now on a business trip in Los Angeles, declares that despite difficulties in excessive taxation and absence of arterial highways, Mexico may be expected to absorb an increasingly larger amount of American automotive equipment in the future.

Mr. Affan reports that rapid strides are being made by the Mexican people toward commercial stability. He attributes this to the wonderful progress that is being made in the establishment of better roads and the increasing use of motor trucks for transporting commodities between cities, which are thus brought closer to the rich agricultural and mining districts.

Country Lacks Railroads

The great undeveloped wealth of the Mexican back country, he says, will make Mexico one of the important commercial nations of the world. But lacking the huge network of railroads that aids business in the United States, Mexico depends largely on motor transportation. When more roads are built the Mexican people will use motor trucks in greater numbers. They have learned that certain economies are possible through the use of motor trucks, to speed up commercial activity. There is a constantly improving financial situation in the country which makes it more attractive to American shippers of automotive products.

"American-built motor trucks and buses are familiar sights on the streets of Mexican cities," said Mr. Affan. "The bus lines are operated under heavy franchise fees. Rigid rules govern the thousands of jitneys which are in use but which are gradually giving way to the large comfortable motor buses."

Calendar of Coming Events

SHOWS

Apr. 3-14 — International Motor Car Show, Frankfurt-on-Main, Germany.

May—International Street and Highway Traffic Safety Exhibition, City Hall, Vienna, Austria.

May 25 — International Exhibition of Roads, Transport and Touring, Show Grounds, Argentine Rural Society, Palermo, Buenos Aires.

Sept. 7-10—6th Annual New Haven Machine Tool Exhibition.

CONVENTIONS

Apr. 14—Tire & Rim Association of America, Inc., Annual Meeting, Hollenden Hotel, Cleveland, O.

Apr. 21-23 — American Welding Society, Engineering Societies Building, New York.

May 6-8—National Machine Tool Builders Association, Providence, R. I.

May 13-15—American Gear Manufacturers Association, Tenth Annual Convention, Book-Cadillac Hotel, Detroit.

May 17-21—National Electric Light Association and Electric Truck Manufacturers Association, Atlantic City, N. J.

June 8-10—Automobile Body Builders Association, Detroit, Hotel Statler.

June 14-19 — Automotive Equipment Association, Mount Royal Hotel, Montreal, Canada.

June 16-18—Thirteenth National Convention, Society of Industrial Engineers, Philadelphia, Bellevue-Stratford Hotel.

Oct. 4-8 — 45th Annual Convention, American Electric Railway Association and manufacturers' exhibit, Cleveland Public Auditorium and Annex.

RACES

Apr. 15—Fresno, Cal.

May 1 — Races at opening of new Speedway, Atlantic City.

May 10—Charlotte, N. C.

May 30-31 — 500-mile race, Indianapolis.

June 12 — Flag Day races, Altoona Speedway.

June 12-13—Rudge-Whitworth 24-hour stock car race, Le Mans, France.

Sept. 6 — Labor Day races, Altoona Speedway.

S. A. E. MEETINGS

National

June 1-4 — Semi-annual meeting, French Lick Springs, Ind.

Sectional

Apr. 6 — Buffalo.

Apr. 7 — Milwaukee.

Apr. 8 — Dayton.

Apr. 8 — Detroit.

Apr. 8 — Indianapolis.

Apr. 9 — Los Angeles.

Apr. 13—Philadelphia.

Apr. 15—New York.

Apr. 19—Cleveland.

Apr. 22—Detroit.

Apr. 23—Chicago.

Apr. 23—Washington.